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FINAL HEALTH AND SAFETY PLAN FOR SOIL DELINEATION SAMPLING OPERABLE UNIT
1 (OU1) SITE 83 MCAS CHERRY POINT NC
7/1/2009
RHEA ENGINEERS & CONSULTANTS, INC

FINAL

HEALTH AND SAFETY PLAN

OPERABLE UNIT 1, SITE 83

SOIL DELINEATION SAMPLING

MCAS CHERRY POINT, NORTH CAROLINA



CONTRACT NO. N40085-08-D-1409
CTO: 0002

RHĒA PROJECT NO. 389

JULY 2009

PREPARED FOR:



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HEALTH AND SAFETY PLAN**

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SOIL DELINEATION SAMPLING
MARINE CORPS AIR STATION CHERRY POINT, NORTH CAROLINA**

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OU1, SITE 83
SOIL DELINEATION SAMPLING
MCAS CHERRY POINT, NORTH CAROLINA

HEALTH AND SAFETY PLAN

1.0 INTRODUCTION

Rhēa Engineers & Consultants, Inc. (Rhēa) is pleased to submit this Health and Safety Plan (HASP) for the soil delineation sampling at OU1 Site 83 on the Marine Corps Air Station (MCAS) Cherry Point, North Carolina. This HASP contains procedures and protocols pertaining to personnel and public health and safety issues at the site. It is through the implementation of this HASP that site hazards and risks with regard to the air sparge system removal will be controlled and minimized.

Rhēa has a thorough Health and Safety Program that contains many health and safety procedures that are referenced in this HASP. The Rhēa Health and Safety Procedures applicable to this project will be available at the MCAS site trailer.

This HASP will allow a consistent approach to protect personnel and the public from potential safety and health problems. It will enable site personnel involved with the product remediation system installation project to be familiar with health and safety requirements and procedures. The text describes the controls, policies, and procedures to be followed, and identifies the responsible personnel and their functions in the performance of the HASP.

This plan has been prepared in accordance with OSHA's "Hazardous Waste Operations and Emergency Response" standard contained in 29 Code of Federal Regulations (CFR) 1910.120 and the U.S. Army Corps of Engineer's (USACE's) Safety and Health Requirements Manual (COE EM-385-1-1, November 2003).

1.1 HEALTH AND SAFETY PROGRAM MAINTENANCE

The Rhēa Team recognizes that health and safety concerns continually change; therefore, this plan will be reviewed periodically as needed. The Site Health and Safety Officer (SHSO) will conduct safety audits to check HASP compliance and to determine if the HASP requires additional revisions. In the event of an emergency response, the response will be evaluated as to its effectiveness, and revisions to the Emergency Response (Section 13.0) will be made, if necessary.

1.2 PLAN ACCEPTANCE

Rhēa personnel and subcontractors engaged in site activities involving contact with or handling of potentially contaminated materials will be required to review this HASP prior to the commencement of work. These individuals will be required to sign their names, indicating that they have read this plan and will comply with the rules, practices, and procedures contained herein. The HASP Acceptance form is included here as Figure 1-1.

1.3 TERMINOLOGY

The following is a list of the terminology that is used throughout this HASP:

ANSI	American National Standards Institute
ASTM	American Standards of Testing Methods
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
ConRep	Construction Representative
CPR	Cardiopulmonary Resuscitation
DPT	Direct Push Technology
EC	Emergency Coordinator
EAD	Environmental Affairs Department
ECCS	Environmental Chemistry Consulting Services, Inc.
EMR	Experience Modification Rating
EMS	Emergency Response Services
EPSC	East Prong of Slocum Creek
°F	Degrees Fahrenheit
FRCE	Fleet Readiness Center East
GPS	Global Positioning System
HASP	Health and Safety Plan
HPP	Hurricane Preparation Plan
HSM	Health and Safety Manager
IDW	Investigative Derived Waste
IWTP	Industrial Waste Treatment Plant

LEPC	Local Emergency Planning Committee
MCAS	Marine Corps Air Station
MEC	Military Environmental Construction Corp.
MSDS	Material Safety Data Sheet
NADEP	Naval Air Depot
NAVFAC	Naval Facilities Engineering Command
NCDENR	North Carolina Department of Environment and Natural Resources
NELAC	National Environmental Laboratory Accreditation Conference
NIOSH	National Institute of Occupational Safety and Health
NOSC	Navy On-Scene Coordinator
NRC	National Response Center
OSHA	Occupational Safety and Health Administration
OT	Oral temperatures
OVA	Organic Vapor Analyzer
PAH	Polycyclic Aromatic Hydrocarbons
PM	Project Manager
PEL	Permissible Exposure Limit (8-hour time weighted average)
POL	Petroleum, Oil, and Lubricant
PPE	Personal Protective Clothing and Equipment
ppm	Parts per million
PRECON	Pre-construction Meeting
Rhēa	Rhēa Engineers & Consultants, Inc.
ROICC	Resident Officer in Charge of Construction
SAR	Site Assessment Report
SHSO	Site Health and Safety Officer
SS	Site Superintendent
STEL	Short-Term Exposure Limit
SWMU	Solid Waste Management Unit
TestAmerica	TestAmerica Laboratories, Inc.

USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USCG	U.S. Coast Guard
USMC	U.S. Marine Corps
USN	U.S. Navy

1.4 REFERENCES

The following documents were used as references in the preparation of this HASP:

- Standard First Aid Manual, American Red Cross;
- Occupational Safety and Health Administration (OSHA) Safety and Health Standards, 29 CFR 1910 and 1926 (specifically 1926.65);
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, National Institute of Occupational Safety and Health (NIOSH)/ (OSHA)/United States Coast Guard (USCG)/United States Environmental Protection Agency (USEPA);
- A Guide to Industrial Respiratory Protection, NIOSH;
- Standard Operating Safety Guides, USEPA;
- Occupational Health Guidelines for Chemical Hazards, NIOSH/OSHA;
- Threshold Limit Values and Biological Exposure Indices, ACGIH;
- Safety and Health Requirements Manual, EM-385-1-1, November 2003, US Army Corps of Engineers;
- Hazardous Chemicals Desk Reference, Third Edition, Van Nostrand-Reinhold; and
- Rhēa Corporate Health and Safety Procedures Manual.

2.0 SIGNATURE SHEETS

Plan Approved By:

Name: Erica L. S. DeLattre
Title: Corporate Health and Safety Manager
Company: Rhēa Engineers & Consultants, Inc.
Telephone: (724) 443-4111
Fax: (724) 443-4187

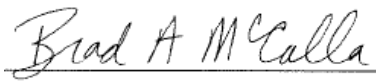
I hereby acknowledge that I have reviewed and approve the tenets of this Health and Safety Plan:

Signature: 
Erica L. S. DeLattre, Corporate Health and Safety Manager

Plan Concurrence:

Name: Brad McCalla
Title: Site Superintendent (SS), Site Health and Safety Officer (SHSO)
Company: Rhēa Engineers & Consultants, Inc.
Telephone: (724) 443-4111
Fax: (724) 443-4187


I hereby acknowledge that I have reviewed and concur with the tenets of this Health and Safety Plan:

Signature: 
Brad A. McCalla, SS, SHSO

Plan Concurrence:

Name: Zach Wicks
Title: Alternate Construction Site Superintendent, Alternate Site Health and Safety Officer (SHSO)
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Telephone: (724) 443-4111
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I hereby acknowledge that I have reviewed and concur with the tenets of this Health and Safety Plan:

Signature: 
Zachary D. Wicks, Alternate SS, Alternate SHSO

3.0 BACKGROUND INFORMATION

Rhēa will be collecting and analyzing soil samples at OU1 Site 83 at the MCAS Cherry Point, North Carolina. This work will be performed under Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic, Contract No. N40085-08-D-1409 CTO-0002. The

objective of the soil sampling is to confirm residual contamination of polycyclic aromatic hydrocarbons (PAHs), pesticides, and lead at the site, characterize portions of the site where historical information is limited or suspect, and delineate the vertical and horizontal extent of impacted site soils. This information will be incorporated into future site documents and will be used to develop feasible remedial alternatives. These investigative soil samples will be utilized as pre-confirmatory samples in the event that an excavation remedial alternative is selected.

Soil samples will be collected from three areas (i.e., Areas A, B, and C) at Site 83, including the former area of Building 96 and the adjacent lot, the area west of Building 96, and the area southwest of Building 96. Samples will be collected at a minimum of 29 locations and analyzed for specific PAHs and pesticides. A select grouping of samples will also be analyzed for lead.

Environmental Chemistry Consulting Services, Inc. (ECCS), a National Environmental Laboratory Accreditation Conference (NELAC) and NCDENR certified mobile laboratory, will provide analytical services for this project. TestAmerica Laboratories, Inc. (TestAmerica) will provide fix-based analytical services for lead analysis.

3.1 SITE HISTORY AND DESCRIPTION

MCAS Cherry Point is a 13,164-acre military reservation located north of the town of Havelock in southeastern Craven County, North Carolina. The boundaries of MCAS Cherry Point include the Neuse River to the north, Hancock Creek to the east, North Carolina Highway 101 to the south, and an irregular boundary approximately $\frac{3}{4}$ -mile west of Slocum Creek to the west.

OU1 is an industrial area in the southern portion of the Air Station, and covers an area of over 565 acres. Much of the area is covered with buildings and pavement, including portions of the flight line. The East Prong of Slocum Creek (EPSC) forms the western boundary of OU1. The other boundaries include C Street and Sandy Branch to the northwest and portions of the flight line and runways to the northeast and southeast.

Site 83 is a former pesticide mixing area, approximately one acre in size, located in the southwest portion of OU1, near Site 16 and East Prong Slocum Creek. The former pesticide shop (Building 96) was constructed before 1948 and was used as a pesticide mixing and storage area from 1965 to 1981 until a new pesticide shop was built at another location. Building 96 was used for storage of equipment and hazardous materials until 1997, when it was subsequently demolished. In early 2006 the Building 96 concrete foundation was removed during a non- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) demolition project. Geotextile fabric was

placed over the removed foundation area and covered with stone to eliminate potential exposure pathways.

The area around the Building 96 footprint is relatively flat and is covered by asphalt and concrete. A grassy area is located west of former Building 96, adjacent to the site boundary. The western edge of this grassy area contains a steep slope which leads to the wetland adjacent to East Prong Slocum Creek.

Site 83 was first identified by MCAS Cherry Point in 1997. A Solid Waste Management Unit (SWMU) Assessment Report (SAR) was conducted in 1998 that included the collection of soil, groundwater, and sediment samples. Groundwater and soil contamination was identified and an additional investigation of Site 83 was recommended as part of the comprehensive evaluation of OU1. Soil contamination was also identified outside of the Site 83 boundary in the down slope wetland area. This area of contamination is considered to be associated with Site 83.

3.2 SAMPLING ACTIVITIES

3.2.1 Site Tasks

The technical approach for the proposed field activities is summarized below. Primary tasks associated with the investigation include mobilization and site setup, utility clearance, site clearing, direct push technology (DPT) soil sampling, and site restoration.

Rhēa will procure the following subcontractors to support the site investigation activities:

- Utility locator;
- Land clearing services;
- Driller;
- Mobile analytical laboratory; and
- Fixed analytical laboratory.

Rhēa will coordinate the site activities with NAVFAC and the MCAS EAD.

3.2.2 Mobilization and Site Setup

This task includes the mobilization of personnel and equipment to the work site, setup of the mobile laboratory, and marking areas for utility surveying and site clearing.

The ECCS mobile laboratory contains equipment with a radiological source that is used in the analysis of samples; therefore, in accordance with MCAS Cherry Point policy, an

approval will be required to enter the base. Mobile laboratory personnel will obtain this approval prior to mobilization.

3.2.3 Utility Clearance

Prior to initiating intrusive activities, a Level B underground utility survey will be performed by a professional locating service to mark the lateral extent of existing underground utilities within the removal areas. A Level B survey is non-intrusive and only marks the utilities on the ground surface with marking paint.

3.2.4 Clearing

Approximately 0.8 acres of trees and underbrush will be cleared prior to sampling activities. The vegetative material will be chipped/grinded in-place using heavy duty rubber tracked brush grinders or excavators mounted with saw and/or grinder heads. There will be little to no ground disturbance from these activities.

3.2.5 Soil Sampling Procedures

The soil sampling procedures are detailed in the Final UFP-SAP, OU1, Site 83 Soil Delineation Sampling, MCAS Cherry Point, North Carolina, July 2009 (Rhēa). The soil sample locations will be located with survey-grade Global Positioning System (GPS) equipment and the locations will be marked with pinflags prior to sampling.

Soil samples will be collected using DPT sampling methods. At each location, continuous soil cores will be collected to the required depth. Five soil samples will be collected at 1-foot depth intervals (0-1 foot (ft), 1-2 ft, 2-3 ft, 3-4 ft, and 4-5 ft) at each location. Three distinct areas were identified based on location and topography. These areas are identified as Area A -Site 83 (the former building 96 location) and adjacent lot, Area B - west of Site 83 (on the steep slope), and Area C - southwest of Site 83 (area of previous soil removals), and analyses will be as follows:

- Area A (Site 83 and adjacent lot) – benzo(a)pyrene, benz(a)anthracene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno (1,2,3-cd) pyrene, dieldrin, heptachlor epoxide, heptachlor, 4-4' DDE, 4-4' DDD, 4-4' DDT, and chlordane
- Area B (West of Site 83) – benzo(a)pyrene, benz(a)anthracene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno (1,2,3-cd) pyrene, dieldrin, heptachlor epoxide, heptachlor, 4-4' DDE, 4-4' DDD, 4-4' DDT, chlordane, and lead

- Area C (Southwest of Site 83) – benzo(a)pyrene, benz(a)anthracene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno (1,2,3-cd) pyrene, dieldrin, heptachlor epoxide, heptachlor, 4-4' DDE, 4-4' DDD, 4-4' DDT, and chlordane

The 0-1 ft and 2-3 ft depth intervals will initially be analyzed from each location at Areas A and B. If the 2-3 ft depth interval sample does not meet the applicable RSL (for industrial soil) for a particular compound, the 3-4 ft sample interval will be analyzed for the constituents that did not meet the RSL (for industrial soil) in the 2-3 ft depth interval. Likewise, if the 3-4 ft depth interval sample does not meet the applicable industrial standard for a particular compound, the 4-5 ft sample interval will be analyzed for the constituents that did not meet RSL (for industrial soil) in the 3-4 ft depth interval. For Area C, the 0-1 ft, 2-3 ft, and 3-4 ft depth intervals will be analyzed. Subsequent depth intervals will be analyzed, if necessary, as described above.

If the 0-1 ft analytical result is above the RSL, AND the 2-3 ft analytical result is below the RSL, the 1-2 ft depth interval will be analyzed. The 1-2 ft depth interval is considered a secondary sample. This additional analysis is being performed to better delineate the vertical extent of contamination.

In the event that the soil is not delineated in a specific direction, secondary soil samples will be collected. Once an area is delineated in a particular direction, it is anticipated that additional soil samples will be collected between the exceedance and non-exceedance borings. These samples serve to tighten the delineation around a “hot” sample.

A Rhēa field team member will characterize the lithology (i.e., physical characteristics, soil type, cohesiveness, color, grain size, and relative moisture content) of the soil at each boring location and record the data into a field book. Upon completion of sampling at each location, equipment will be removed and excess sample material will be returned to the borehole. Boring locations will be backfilled with bentonite chips.

The Rhēa Field Team Leader can re-locate soil boring locations when site conditions warrant and with approval from the Rhēa Project Manager. Examples of scenarios where boring locations may be re-located include conditions where refusal is encountered or adequate sample material is not retrieved, or the presence of a physical obstacle.

3.2.6 Surveying

The soil sample locations will be located with survey-grade Global Positioning System (GPS) equipment and the locations will be marked with pinflags prior to sampling. Sample locations that were moved in the field and any other additional sample locations will also be surveyed to provide northing and easting coordinates.

3.2.7 Equipment Decontamination

Non-disposable sampling equipment will be decontaminated prior to use and between sampling locations. Macro-core samplers and associated equipment used for soil sample collection will be decontaminated by scrubbing and washing with a Liquinox®-water solution and rinsing with potable water.

3.2.8 Investigative Derived Wastes

Investigative Derived Waste (IDW) is expected to consist of DPT soil cores, decontamination fluids, and personal protective equipment. Soil cores generated by sampling efforts will be containerized in 55-gallon steel drums, labeled, and subsequently sampled to determine disposal requirements. Disposal will be performed in accordance with MCAS Cherry Point guidance. IDW soil will be characterized and properly disposed of within 90 days of generation. Decontamination fluids generated by sampling efforts will be containerized and disposed of at the Industrial Wastewater Treatment Plant (IWTP). A chit signed by the MCAS Environmental Affairs Department (EAD) will accompany each delivery of water to the IWTP. Personal protective equipment (PPE) and other wastes (i.e., gloves, disposable sampling equipment) will be rinsed and disposed of as regular trash.

3.2.9 Site Restoration

Cleared areas will be seeded and mulched upon completion of sampling activities.

3.3 EMR RATING

Insurance providers create an Experience Modification Rating (EMR) by comparing worker's compensation claims of the evaluated company to other similar size companies in the same industry. Rhea has never had a worker's compensation claim; therefore Rhea does not have an EMR. In place of the required EMR, Rhēa's Merit Adjustment has been included in Appendix A. The Merit Adjustment was provided by Rhēa's insurance broker.

3.4 POTENTIAL HEALTH HAZARDS

The following section outlines the primary potential health hazards that have been identified at the site. Presented in subsequent sections are the areas in which the potential health hazards may be found, along with the form(s) in which the potential contaminant may be found. Particular attention will be paid during site-specific training to discuss the

potential health hazards associated with the activities to be carried out at the site. These hazards will be reaffirmed in the daily safety meetings.

3.4.1 Chemical Hazards

Previous investigations identified that Site 83 had several chemical constituents that exceeded the NCDENR Regional Screening Levels (RSL) for industrial soil: These chemicals included:

- PAHs that include: benzo(a)pyrene, benz(a)anthracene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene;
- Pesticides that include: dieldrin, chlordane, 4-4' DDT, 4-4' DDE, 4-4' DDD, heptachlor, and heptachlor epoxide; and
- Lead (in one location only).

PAHs: PAHs are one of the most widespread organic pollutants. They are formed by incomplete combustion of carbon-containing fuels. All five on the PAHs found at Site 83 exceeding the NCDENR RSL are listed by the EPA as Group B2 carcinogens, or probable human carcinogens. The primary constituents at this site are benzo(a)pyrene, benz(a)anthracene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. There is no PEL value for these individual PAHs; therefore, each is defaulted to the PEL for coal tar pitch volatiles, which is 0.2 mg/m³.

Dieldrin: Dieldrin is a chlorinated hydrocarbon insecticide with a chemical structure similar to that of naphthalene. It is an extremely persistent organic pollutant, and does not break down easily. Dieldrin can also be absorbed through the skin. Dieldrin is a probable human carcinogen with a PEL of 0.25 mg/m³.

Chlordane: Chlordane is a hydrophobic organochlorine insecticide product commercially used for fire ant control in power transformers. It may appear as an amber-colored, brown, or colorless, viscous, liquid. Chlordane may also appear as white crystals and has a slightly pungent, aromatic odor. It can also be absorbed through the skin. Chlordane is a probable human carcinogen with a PEL of 0.5 mg/m³.

4-4' DDT: DDT, or dichlorodiphenyltrichloroethane, is an organochlorine insecticide and one of the best-known synthetic pesticides. It is a highly hydrophobic, colorless, crystalline solid with a weak, chemical odor. DDT is a probable human carcinogen with a PEL of 1 mg/m³.

4-4' DDE: DDE, or dichlorodiphenyldichloroethylene, is formed by the breakdown (or “dehydrohalogenation,” the loss of hydrogen chloride) of DDT. It is a white crystalline solid. DDE is a probable human carcinogen. There is no OSHA PEL for DDE.

4-4' DDD: DDD, or dichlorodiphenyldichloroethane, is formed by the breakdown (or “dehydrohalogenation,” the loss of hydrogen chloride) of DDT. It is a colorless crystalline solid. DDD is a probable human carcinogen. There is no OSHA PEL for DDD.

Heptachlor: Heptachlor is an organochlorine cyclodiene insecticide. It is a persistent organic pollutant, and does not break down easily. It is usually found as a white or tan powder and has a camphor-like odor. Heptachlor can also be absorbed through the skin. Heptachlor is a probable human carcinogen with a PEL of 0.5 mg/m³.

Heptachlor Epoxide: Heptachlor epoxide is formed by the metabolism of heptachlor. It is a white crystalline solid and is a probable human carcinogen. There is no OSHA PEL for Heptachlor Epoxide.

Lead: Lead is a soft, heavy, toxic and malleable poor metal. It is bluish white when freshly cut but tarnishes to dull gray when exposed to air. Lead is a potent neurotoxin which accumulates in soft tissues and bone over time. The PEL for lead is 0.050 mg/m³.

The Material Data Safety Sheets for the above chemicals is included as Appendix B.

3.4.2 Potential Physical Safety Hazards

During site activities, Rhēa workers will obey the rules and regulations developed by the United States Navy (USN) and United States Marine Corps (USMC), as well as those presented in this HASP. Of special concern, with respect to site safety, are preventative measures and safe working practices that can minimize the risk of injury to site personnel. The following is a list of preventive measures that can be taken to complete site activities in a safe manner:

- Back strain can be prevented by employing proper lifting techniques when moving samples, supplies, equipment, and tools. Site personnel will be instructed in proper lifting procedures during site-specific training;
- Slipping on wet surfaces can be minimized by using an absorbent material in a wet area, as well as wearing boots with a deep tread;

- Heavy equipment hazards can be minimized by posting signs that notify site personnel as to the existence of such equipment in the area. Additionally, those individuals operating pieces of heavy machinery should know their surroundings and the existence of workers in their respective areas;
- Live electrical lines and/or bare wires will be avoided at all times;
- Eye and hearing protection will be worn at all times;
- Site personnel will be instructed regarding the location and use of fire suppression equipment;
- Debris will be collected and properly containerized, so that flying debris does not become a safety hazard;
- Site personnel will be familiar with the proper use of small tools; and
- In areas of potential traffic hazards, barricades, or other appropriate traffic control devices will be used.

Additionally, the following sections describe procedures to be followed by site workers for: heavy and bulky loads; flame, heat and spark producing operations; slip, trip and fall hazards; head and back injuries; equipment and hand tools; and noise.

Heavy and Bulky Loads: Back injury prevention should be given high priority when performing work activities. Individuals should exercise good judgment before heavy and bulky loads are lifted or handled manually. Mechanical equipment such as forklifts, wheelbarrows, hand trucks, loaders, and cranes should be used whenever possible. If a task involves lifting an object, which is heavier than the individual can lift on his/her own, the individual should seek assistance and/or use mechanical equipment to assist in the lifting.

Flame, Heat, or Spark Producing Operations: Because of the possibilities of flammable materials being present, flame, heat, or spark producing operations will be limited. If a case arises where hot work is necessary, workers will follow the “Rhēa Hot Work Procedure” available at the site trailer and will obtain a Hot Works Permit from the Fire Department.

Slip/Trip/Fall Hazards: Some areas may have wet surfaces, which will greatly increase the possibility of inadvertent slips. Caution must be exercised when using steps and stairs due to slippery surfaces in conjunction with fall hazards. Use of handrails when climbing stairs will be enforced, and handrails will remain secure until the support itself is removed and lowered to ground level. Good housekeeping practices are essential to minimize trip hazards.

The work area shall be kept clean and orderly. Tools and debris must be picked up and placed in the proper place to prevent a tripping hazard. Walkways and grating shall be kept in good condition. Spills will be cleaned up immediately. Personnel shall not walk or climb on piping, valves, fittings, or any other equipment not designed as walking surfaces.

Rhēa personnel should be constantly aware of the possibility of slips, trips, and falls due to poor and possibly slippery footing in the work areas before crossing either in front of or behind a piece of heavy equipment. Rhēa personnel will signal the operator and receive confirmation before moving.

Head and Back Injuries: As minimum requirements, hard hats and safety glasses will be donned prior to performing work activities. This requirement will minimize minor injuries caused by a worker's head being impacted by hard objects while working around and under piping and other process related structures. At the daily safety meeting, personnel are instructed in proper lifting techniques and reminded not to lift heavy items without assistance.

Equipment and Hand Tools: Hand tools and power tools will be in good repair and will be used only for the task for which they were designed. Damaged tools will be tagged "out of service." Tools will be kept clean. Sharp tools will not be carried in pockets. When working, overhead tools will be placed in a receptacle or secured when not in use. Tools cannot be dropped from heights. Only non-sparking tools will be used in flammable or explosive atmospheres. Cheater pipes will not be used.

3.4.3 Potential Environmental Hazards

Environmental factors such as weather, wild animals, insects, and irritant plants pose a hazard when performing outdoor work. The SHSO will take all necessary measures to alleviate these hazards should they arise.

Hazardous Flora

An incidence of contact by individuals to poisonous/thorny plants is high while working in wooded areas. Bare skin should be covered (i.e., long pants and shirt, steel toe boots,

leather or cotton gloves, safety glasses, and head protection) as much as practical when working in forested or densely vegetated areas. Personnel should avoid entering an area in the direct path of known poisonous flora (i.e., poison ivy, poison oak, or poison sumac); a secondary route should be selected. Care should also be taken when walking in such areas as uneven terrain or vines may present a tripping hazard.

Hazardous Fauna

Mosquitoes and gnats pose a nuisance and physical hazard to field personnel; they distract workers, leading to accidents, and pose a physical threat by transmitting live microorganisms. Avoiding the use of perfumes and scented deodorants and donning light colored clothing is preferable. The use of an insect repellent is encouraged and will be provided, as needed.

Poisonous snakes such as the rattlesnake, copperhead, and cottonmouth (water moccasin), all known as pit vipers, are common to the eastern United States. Snakes typically do not attack people but will bite when provoked, angered, or accidentally injured (as when stepped on). If a snake is encountered, quick/jerky motions and loud noises should be avoided. The snake should not be provoked and the individual is to retreat slowly; do not provoke the snake.

In the event of a snakebite injury, the following procedures will be followed:

Look for signs and symptoms such as the characteristic appearance of two small holes, usually about a half-inch apart, with surrounding discoloration, swelling, and pain. Systemic signs (such as, may or may not occur) include weakness, sweating, faintness, and signs of shock.

Provide treatment as follows:

1. Calm the victim and keep affected area still.
2. Contact ambulance if you cannot provide victim with transportation to the nearest hospital.
3. Wash the wound.
4. Keep the affected area below the level of the heart if bite is on the arm or leg.
5. Treat for shock.
6. Monitor airway, breathing, and circulation.

7. Obtain physical description of snake, if possible.
8. Provide the emergency medical responder (either the ambulance attendant or the emergency room at the hospital) with all pertinent information such as how long ago the bite occurred, the type of snake (if known), any known allergic conditions (if known), etc.
9. Inform the SHSO as soon as possible.

There are two spiders commonly found in the United States whose bite can be serious: the black widow and the brown recluse spider. These bites may be serious, even life threatening. Many other spiders will bite, but they usually do not produce serious complications.

The black widow spider measures approximately 1 inch long with its legs extended. It is glossy black in color and has a distinctive yellow-orange marking in the shape of an hourglass on its belly. On its back, however, there is no marking, and unless you happen to turn the spider over, you cannot see this mark. The danger of the black widow spider bite lies in its systemic manifestations. The venom from this spider attacks the nervous system, resulting in severe muscle cramps with board like rigidity of the abdominal muscles, tightness in the chest, and difficulty in breathing. Sweating, nausea, and vomiting will also occur.

The emergency treatment for the black widow spider bite is basic life support. Sometimes the individual is not even aware of having been bitten, or where. Apply cold to the site of the bite if it can be identified. There is a specific antivenin for this spider bite that must be administered by a physician. It is particularly important to identify the spider, and bring it in, if you can.

The brown recluse spider is a little bit smaller than the black widow spider and is dull brown in color. It has a violin-shaped mark on its back, which can be seen when you are looking at the spider from above. The spider gets its name because it tends to live in dark areas, corners, and old unused buildings. The bite from this spider typically produces local effects rather than systemic manifestations. The venom of the brown recluse spider causes severe local tissue damage and can lead to an ulcer and gangrene. The bitten area becomes red, swollen, and tender within a few hours after the bite. A small blister forms, and several days later, this may form a large scab, covering a deep ulcer. Death is rarely reported.

The emergency treatment for the brown recluse spider is similar to that for the black widow spider except that these bites need local surgical treatment. Spider bite victims

should be brought to the hospital. Again, if possible, identification of the spider should be carried out.

There is also a potential to contact other dangerous insects; these include fire ants, chiggers, bees, wasps, hornets, mites, fleas, and ticks. Personnel should perform checks periodically and at the end of the work shift, especially when working in grassy or forested areas. Insect bites must be reported to the SHSO.

Before initiating site activities, each individual will be questioned as to any known sensitivities to the previously mentioned organisms or agents.

Heat Stress Disorders: The following is a summary of signs and systems of heat stress disorders.

- ***Heat rash*** – characteristic rash that may develop on the skin in areas that may be chapped by clothing. Frequent clothing changes help to prevent chapping from contact with wet clothes.
- ***Heat cramps*** – caused by heavy sweating and inadequate electrolyte replacement. Provide frequent breaks with fluid replacement. Cramps are usually relieved when victim is moved to a cool resting place and provided fluids every 15 minutes for approximately 1 hour.
- Symptoms include:
 - Muscle spasms; and
 - Pain in hands, feet, or abdomen.
- ***Heat exhaustion*** – caused by increased stress of various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Immediately remove the victim from the hot environment and provide rest while lying the victim down with feet elevated, and care for shock. Attempt to cool the victim by fanning or applying wet towels. Provide fluid replacement every 15 minutes and refer for medical evaluation if not improved within 30 minutes. Symptoms include:
 - Pale, cool, moist skin;
 - Heavy sweating;
 - Dizziness;

- Nausea; and
 - Fainting.
- **Heat stroke** – temperature regulation fails and the body core temperature rises to critical levels. Immediate action must be taken to cool the body. Competent medical care must be obtained immediately because this is a life threatening disorder. Symptoms include:
 - Hot, dry skin, usually red and mottled;
 - 104° F temperature;
 - Confusion and/or dizziness;
 - Loss of consciousness;
 - Convulsions; and
 - Strong rapid pulse.

It is recommended that workers break at least every two hours for 10 to 15 minute rest periods when temperatures rise above 72.5 degrees F and PPE is worn, i.e., Modified Level D PPE). Ambient temperatures will be determined from a thermometer shielded from radiant heat. In addition, workers are encouraged to take rests whenever they feel any adverse effects that may be heat-related. The frequency of breaks may need to be increased upon worker recommendation. Heat stress can be prevented by assuring an adequate work/rest schedule. Guidelines are printed below.

Ambient Temperature	Level D Personal Protective Clothing and Equipment (PPE)	Modified Level D PPE
90 °F or above	After 45 minutes of work	After 15 minutes of work
87.5 – 90 °F	After 60 minutes of work	After 30 minutes of work
82.5 – 87.5 °F	After 90 minutes of work	After 60 minutes of work
77.5 – 82.5 °F	After 120 minutes of work	After 90 minutes of work
72.5 – 77.5 °F	After 150 minutes of work	After 120 minutes of work

The work/rest schedule can be calculated based on heat stress monitoring results. Monitoring consists of taking the radial pulse of a worker for 30 seconds immediately after exiting the work area. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same. If the heart rate still exceeds 110 beats per minute at the next rest period, decrease the work period by one-third. The initial rest period should be at least 10 minutes.

Monitoring for heat stress will begin when the ambient temperature reaches or exceeds 80 °F. Monitoring will include pulse rate, weight loss, oral temperature and signs and symptoms of heat stress. The employee's radial pulse will be monitored for 30 seconds to determine heart rate. When monitored, oral temperatures (OT) will be obtained using a clinical thermometer or equivalent. If the employee OT exceeds 99.6 °F, the work period will be reduced by one-third. If after this work period, the oral temperature still exceeds 99.6 °F, the work period will again be shortened by one-third. If the employee OT exceeds 100.6 °F, the employee will not be permitted to work at the site during hot weather.

Exposure to Cold: With outdoor work in the winter months, the potential exists for hypothermia and frostbite. Protective clothing greatly reduces the possibility of hypothermia. However, personnel will be instructed to wear warm clothing and to stop work should conditions become excessively cold. Employees will also be advised to change into dry clothes if their clothing becomes wet from perspiration or from exposure to precipitation. Since wind chill temperatures take into account the potential for loss of body heat through convection, the wind-chill adjusted temperature will be used to evaluate for potential cold stress occurrence.

In cold weather, the potential for frostbite exists, especially in body extremities. Personnel will be instructed to pay particular attention to hands, feet, and any exposed skin when dressing. Personnel will be advised to obtain additional clothing if they begin to experience loss of sensation due to cold exposure.

Employees will be encouraged to move into the heated areas such as a vehicle or adjacent building on site at regular intervals depending upon the severity of ambient temperatures. When temperatures are less than 20 degrees F (actual or wind chill) workers should break regularly (every 45 minutes at a minimum). Since cold weather does cause significant water loss as a result of the dryness of the air, fluid intake will be encouraged to prevent dehydration, which directly affects blood volumes and flow to the extremities. Warm, sweet, caffeine-free, nonalcoholic drinks and soup offer the best fluid replacement and provide calorie energy. Symptoms of cold stress, including heavy shivering, excessive fatigue, drowsiness, irritability, or euphoria, necessitate immediate medical attention.

Hearing Conservation: Working with and around the operation of heavy equipment, as well as in the vicinity of heavy equipment or air powered hand tools, typically results in employee noise exposure equal to or in excess of an 8-hour time weighted average of 85 decibels. The SHSO will monitor noise periodically with an audio dosimeter or sound level meter. Time weighted averages will be calculated automatically by the instrument or manually. Such exposure requires the implementation of a hearing conservation program in compliance with 29 CFR 1910.95. The SHSO is responsible for providing employees working with or near heavy equipment or aircraft with appropriate hearing

protection and verifying that the protection is properly worn. The SHSO will follow the procedures outlined in the “Rhēa Hearing Conservation Procedure” posted at the MCAS site trailer. Site personnel will be provided with both in-ear and out-of-ear protection devices (in compliance with American National Standards Institute (ANSI) 512.6-1984 and ANSI 53.19-1974, respectively).

4.0 RESPONSIBILITIES AND LINES OF AUTHORITY

4.1 CORPORATE HEALTH AND SAFETY PERSONNEL

Rhēa’s Project Manager, Ms. Erica DeLattre is the Health & Safety Manager to be accountable to monitor and enforce the policies and procedures as set forth in this HASP.

The following listed Rhēa Corporate personnel shall have the authority to intervene and suspend work in the interest of safety policy compliance:

**PROJECT MANAGER, HEALTH & SAFETY
MANAGER**

Ms. Erica DeLattre (Rhēa)

(724) 443-4111 (Office)

(724) 316-6593 (Cell)

(724) 443-4187 (Fax)

**SITE SUPERINTENDENT, SITE HEALTH AND
SAFETY OFFICER**

Mr. Brad A. McCalla (Rhēa)

(724) 443-4111 (Office)

(724) 462-4202 (Cell)

(724) 443-4187 (Fax)

Site safety is accomplished through an integrated team effort. The health and safety personnel, supervisors, site workers, and administrative team all perform essential safety roles. The following sections outline the work team’s respective responsibilities and training requirements and identify key personnel.

4.2 SITE HEALTH AND SAFETY PERSONNEL

The following individuals share responsibility for health and safety at the site:

RHĒA SITE SUPERINTENDENT & SITE HEALTH AND SAFETY OFFICER

Brad McCalla

(252) 447-1700 (Site Trailer Phone)

(724) 831-7705 (Cell)

RHĒA ALTERNATE SITE HEALTH AND SAFETY OFFICER

Zachary Wicks

(252) 447-1700 (Site Trailer Phone)

(717) 580-7511 (Cell)

4.2.1 Project Manager

The Rhēa Project Manager (PM) has the overall responsibility for the project and verifies that the remediation goals are attained in a manner consistent with the HASP requirements. The PM will coordinate with the SHSO to confirm that the remedial action goals are completed in a manner consistent with the HASP.

4.2.2 Site Health and Safety Officer

The SHSO has the responsibility for administering the HASP relative to site activities, and will be available full-time on site or at the MCAS site trailer while site activities are in progress. The SHSO's primary operational responsibilities include personal and environmental monitoring, coordination of job safety analyses, personal protective equipment maintenance, and assignment of protection levels. The SHSO will direct field activities involved with safety and is authorized to stop work when an imminent health or safety risk exists. The SHSO is responsible for informing on-site personnel of safety requirements.

Mr. McCalla of Rhēa will be the acting SHSO. He possesses remedial action experience and a working knowledge of the state and federal occupational safety and health regulations. He has completed the required 40-hour health and safety training in accordance with 29 CFR 1910.120.

In addition, Mr. McCalla and at least one additional on-site professional employee will be trained in standard first aid and Cardiopulmonary Resuscitation (CPR). All training certificates and certifications will be retained at the site during the project. Mr. McCalla

possesses demonstrable experience and has received specialized training in the use and selection of PPE and is familiar with the PPE implementation program. Furthermore, he has experience in the proper use of air monitoring instrumentation and sampling procedures relevant to the activities that will be performed at the site.

Mr. McCalla will contact the MCAS Fire Station (911), police, and ambulance services, as well as the nearest poison control center. He will communicate to these groups the following information: type of work being conducted, potential health and safety hazards present at the site, and duration of the project.

The SS/SHSO will be in direct contact with MCAS Environmental Affairs Department (EAD), NAVFAC RPM, Rhēa and mobile laboratory, and drilling personnel, and other site workers. It will be his responsibility to coordinate with these individuals regarding the health and safety aspects of the work activities.

4.2.3 Site Labor Forces

Site labor forces will be comprised of personnel within appropriate trade categories who possess the training and experience to work at a remedial site. Those who may be exposed to hazardous substances and/or potential health and safety hazards will have completed the 40-hour OSHA training and the required refresher training.

5.0 SUBCONTRACTORS AND SUPPLIERS

When it is necessary for Rhēa to hire subcontractors, subcontractor personnel will adhere to policies and procedures outlined in this HASP. Subcontractors that provide on-site services are encouraged to develop and submit to the SHSO, for approval, their own project specific HASP. Such plans must meet or exceed the requirements of the Rhēa HASP.

In lieu of a formal plan submitted by a subcontractor, the subcontractor or supplier must subscribe to the tenets of the HASP. Subcontractor and supplier personnel that work or visit the project site shall be required to review the HASP and accept the Rhēa Superintendent/SHSO as the governing site authority. These individuals will be required to sign their name, indicating that they have read this plan and will comply with the rules, practices, and procedures contained herein. The Health and Safety Plan Acceptance Form is included as Figure 1-1.

Rhēa is responsible for informing its lower tier subcontractors and suppliers of these requirements, for directing and supervising the work of subcontractors, and for assuring that its subcontractors adhere to the requirements herein. Rhēa may request the subcontractor to provide proof of its subcontractors' adherence to all rules and

regulations and will prohibit access to Rhēa property or job site or our client's property for those contractors not in compliance.

It is also the responsibility of Rhēa subcontractors to work in a manner so as not to endanger themselves, fellow employees, Rhēa Team employees, authorized work site visitors and customers, the general public, the environment, and Rhēa equipment or property.

5.1 GENERAL REQUIREMENTS

Where the Rhēa SHSO deems appropriate, the subcontractor will provide a safety representative to monitor work practices. The subcontractor's safety representative may be required to remain on site at all times while work is in progress. Subcontractors noting any unsafe practices, dangerous situations, or unsafe conditions, must immediately report the information to the Rhēa SHSO, before commencing or continuing work.

Subcontractors and their employees working at the site are required to comply with the Rhēa Contractor/Subcontractor Procedures, HASP, and their own site-specific approved accident prevention plan, whichever is most stringent.

5.2 HAZARD COMMUNICATION (29 CFR 1910.1200)

Each subcontractor must have a Hazard Communication Program in compliance with 29 CFR 1910.1200 or 29 CFR 1926.59. Subcontractors will provide Rhēa with Material Safety Data Sheets (MSDSs) for all chemicals or otherwise hazardous materials they introduce to Rhēa facilities and work locations.

The Rhēa SHSO will be responsible for hazard communication training for the subcontractor as part of the site safety orientation.

Rhēa will provide the following information to the subcontractor's supervisor who will be responsible for his/her crew's training:

- A description of hazardous materials, in any, that exist in the area in which they will be working;
- A copy of the MSDSs for the hazardous materials in the work area;
- Training on the MSDS and the hazardous material labeling system in effect at the location; and
- Training on the local emergency response procedures.

6.0 TRAINING REQUIREMENTS

This section details the requirements for training of personnel assigned to work at the project site.

6.1 OSHA 1910.120 TRAINING

Rhēa employees and subcontractors working on the site who may potentially be exposed to hazardous substances and/or potential health and safety hazards will have completed the 40-hour health and safety training and 8-hour refresher training as required by OSHA regulations, 29 CFR 1910.120. The SHSO and alternate SHSO will have completed the additional 8-hour supervisory training.

Rhēa will maintain a record of training and refresher courses for on-site Rhēa and subcontractor personnel and a record of site personnel experience under the direction of a skilled supervisor (24 hours minimum). Also, a log of visitors to the site, including name, company name/organization, date, and activities conducted will be maintained at the site. Individuals visiting the site will be required to sign the log. Rhēa will retain these and other health and safety records after project activities have been completed. The standard form used for sign-in and sign-out of visitors is included as Figure 6-1.

6.2 SITE-SPECIFIC TRAINING

Site-specific training will be provided to site personnel involved in the work activities. The training will address potential hazards found at the site and safety measures that must be followed on certain areas of the site where health and safety hazards may exist. Procedures regarding the buddy system, spill response, fire prevention/suppression techniques, levels of protection, recognition of potential hazards, overexposure to chemical hazards, and air monitoring will also be covered as part of the training. Further, the training will include a discussion of general site conditions.

6.3 DAILY SAFETY MEETING

Project personnel will be given briefings by the SHSO daily or additionally, as determined by the SHSO. These daily meetings will further assist site personnel in conducting their activities in a safe manner and provide workers with information on new operations, changes in work practices, or changes in environmental conditions at the work site. Briefings will also be given to facilitate conformance to prescribed safety practices when performance deficiencies are identified during routine, daily activities or as a result of safety audits.

A summary form that will be completed to document topics discussed during each Daily Safety Meeting is included as Figure 6-2. The completed summary form will be provided daily to the ConRep.

6.4 EMERGENCY FIRST AID TRAINING

The SHSO and at least one additional on-site Rhēa professional employee will be trained in American Red Cross Standard First Aid, CPR, and the OSHA Bloodborne Pathogens Standard. This training has been provided so that in the event of an emergency or other incident, primary care can be given to an individual in need before professional response providers arrive.

6.5 SPILL RESPONSE TRAINING

Spills will be reported to the MCAS Fire Station (911) immediately. Site personnel will be trained to respond to spills at the site. The SHSO will offer this spill response training during the site-specific training. The training will range from awareness of spill potential to responding to spill situations. Personnel will learn how to prevent spills from occurring, how to look for and identify spills, and the location and proper use of the portable spill containment kit. Specifically, spill response training will include the following:

- Control of an area where a spill has occurred, including setup of barriers to keep personnel not involved in cleanup efforts out of the area;
- Training in the proper use of sorbent, and other cleanup materials; and
- Training in the proper notification and documentation of a spill occurrence.

The portable spill containment kit will include absorbent pads and vermiculite. In the event of a spill, these materials will be used to contain and clean up the spill. Once used, these materials will be containerized and disposed of at a facility licensed to accept such contaminated material.

7.0 HEALTH AND SAFETY INSPECTIONS

7.1 SAFETY INSPECTIONS

The Rhēa Health and Safety Manager (HSM), PM, and/or SHSO may conduct periodic inspections of the site. The SHSO will discuss necessary corrective actions with the PM and/or the HSM and review new procedures.

The HSM or their designated representative may periodically conduct site visits and perform Site Safety Assessments. These Site Safety Assessments will be kept on file at Rhēa's office in Gibsonia, Pennsylvania.

7.2 EXTERNAL INSPECTIONS / CERTIFICATIONS

Rhēa does not anticipate, but may consider, the use of outside sources to provide safety inspections on an as-needed basis.

As required, Rhēa safety equipment will comply with appropriate NIOSH, American Society for Testing and Materials (ASTM), and US Coast Guard or other recognized certification organizations.

8.0 SAFETY AND HEALTH EXPECTATIONS AND COMPLIANCE

8.1 GOALS AND OBJECTIVES

The goals and objectives of the Rhēa Team are to provide a safe and healthful work environment for all employees. The Rhēa Team considers no phase of operations or administration to be of greater importance than injury and illness prevention. Safety takes precedence over expediency and shortcuts. At Rhēa, it is believed all accidents and injuries are preventable. The Rhēa Team will take every reasonable step to reduce the possibility of injury, illness, or accident.

8.2 SAFETY PROCEDURES / NON-COMPLIANCE

Employees and supervisors are informed through training and administrative correspondence that safe behaviors and practices are required on jobs and during Rhēa work activities. Failure to work safely could affect the offending individual, coworkers, the environment, and/or Rhēa assets, and supervisors are authorized to discipline workers who compromise safety by ignoring or attempting to circumvent safety requirements. The Health and Safety department along with superintendents are authorized to stop unsafe work practices, if necessary, until risks of severe injury or illness are adequately mitigated.

9.0 ACCIDENT REPORTING

9.1 EXPOSURE DATA (MANHOURS WORKED)

The HSM and Rhēa Personnel Department track and maintain incident records at the Rhēa Gibsonia, Pennsylvania office.

9.2 ACCIDENT INVESTIGATIONS, REPORTS, AND LOGS

Site personnel will report accidents or unusual incidents to the SHSO. The SHSO is responsible for conducting the emergency response in an efficient and safe manner. It will be the responsibility of the SHSO to determine whether off-site assistance and/or medical treatment are required. The SHSO is responsible for completing the Supervisor's Accident Investigation Report. If an employee is injured, an employee injury report will be completed. A Supervisor's Accident Investigation Report is provided as Figure 9-1. Copies of Employee Injury Reports (Figure 9-2) will be submitted to the EAD, NAVFAC RPM, and the Rhēa HSM.

9.3 IMMEDIATE NOTIFICATION OF MAJOR INCIDENTS

Rhēa will immediately notify EAD, NAVFAC RPM, and the ROICC of any major incident, including injury, fire, equipment/property damage, and environmental incident. A full report will be provided within 24 hours.

9.4 RESPONSE REQUIREMENTS

The American Red Cross or other approved agency shall certify the SHSO and at least one other on-site employee in Adult CPR and First Aid. The trained individuals will be available to provide first aid in the event of an emergency. The following procedure will be followed in response to any major personal injury:

1. The nearest workers will immediately assist a person who shows signs of medical distress or who is involved in an accident. The SS will be summoned.
2. The SS will immediately determine the following:
 - Location of the victim at the work site;
 - Nature of the emergency;
 - Whether the victim is conscious; and
 - Specific conditions contributing to the injury, if known.
3. The following actions will be taken depending on the severity of the incident:
 - ***Life-Threatening Incident:*** If an apparent life-threatening condition exists, the SS will immediately contact local Emergency Response Services (EMS) and the SHSO. An on-site person will be appointed who will meet the EMS

and have him/her quickly taken to the victim. Rhēa personnel will evacuate injured personnel, injury permitting, within the active work zone to a clean area for treatment by EMS personnel.

- ***Non Life-Threatening Incident:*** If it is determined that no threat to life is present, the SS will immediately contact the SHSO who will direct the injured person through procedures appropriate to the nature of the illness or accident. Appropriate first aid or medical attention will be administered.

***Note:** The area surrounding an accident site must not be disturbed until the SHSO has cleared the scene.

Personnel requiring emergency medical attention will be evacuated from active work areas if doing so would not endanger the life of the injured person or otherwise aggravate the injury. Personnel will not enter the area to attempt a rescue if their own lives would be threatened.

10.0 MEDICAL SUPPORT

10.1 FIRST AID

First aid will be administered by the closest, certified individual to the accident/incident. This assistance will be coordinated by the SHSO and will be conducted in a manner so that those rendering assistance are not placed in a situation of unacceptable risk. The primary concern will be to avoid placing a greater number of individuals in jeopardy.

Bloodborne Pathogens Program: In regard to first aid procedures, Rhēa will follow the “Bloodborne Pathogens Procedure” (in accordance with 29 Code of Federal Regulations (CFR) 1910.1030), found in the *Rhēa Corporate Safety Procedures*. A copy of the procedure will be retained at the site, and will be reviewed during site-specific training.

10.2 OFF-SITE MEDICAL ARRANGEMENTS

Prior to the start of work, Rhēa shall arrange for medical facilities personnel to provide timely attention to any injured person at the work sites. Primary Emergency attention will be conducted by Craven Regional Medical Center with the secondary medical facility being Carteret General Hospital. A detailed map with directions to and contact numbers of the primary and secondary medical facilities is provided as

Figures 10-1 and 10-2. Addresses, phone numbers, and directions are as follows:

PRIMARY MEDICAL FACILITY

Craven Regional Medical Center

Non-Emergency Phone No.: (252) 633-8111

2000 Neuse Blvd.

P.O. Box 12157

New Bern, NC 28561

Directions to Medical Center: From the main gate, turn right (west) onto SR 101 (Fontana Blvd.), bear right onto RT US 70 West (W. Main St.), follow 70 West to SR 1200 (Pembroke Road), turn left onto 1st Street, turn left onto US 17 (US 70 Bus/SR 55/Neuse Blvd.), turn right onto Hospital Drive, hospital is on the left.

Emergency Phone No.: 911 (see note below)

Important Note: If dialing 911 from a cell phone, the 911 call center in New Bern (or Carteret) will be contacted. Dialing 911 on a base phone will contact the MCAS Cherry Point 911 operator.

SECONDARY MEDICAL FACILITY

Carteret General Hospital

Non-Emergency Phone No.: (252) 808-6000

3500 Arendell Street

P.O. Drawer 1619

Morehead City, NC 28557

Directions to Carteret General Hospital: From the main gate, turn right (west) onto SR 101 (Fontana Blvd.), turn left onto RT US 70 East (E. Main St.), follow 70 East to North 35th Street, turn left into the hospital.

The Emergency Telephone Number List is provided as Figure 10-3. Other state and federal employee notices such as, but not limited to, Right to Know, Equal Opportunity is the Law, Minimum Wage, and Workers Compensation Carrier Identification, will be posted at the MCAS site trailer along with other data required for emergency response.

11.0 PERSONNEL PROTECTION

Individuals entering work areas will be advised of and protected from potential hazards. The purpose of PPE is to shield or isolate individuals from the potential health and safety hazards that may be encountered at the site. PPE for this project was selected based on

the potential health hazards expected at the site, the work tasks to be performed at the site, and previous project experience. It is understood that site workers have learned the proper donning and doffing, maintenance, and inspection of PPE; however, Rhēa will review these topics during site-specific training.

11.1 POTENTIAL HEALTH HAZARD PROTECTION

This section describes the site-specific requirements for levels of protection (Level D through Level C). The required PPE to be worn at the specific protection levels and air-monitoring requirements are also discussed.

11.1.1 Level D

The following criteria determine Level D protection:

- Air monitoring readings up to 5 ppm above background as detected by an Organic Vapor Analyzer (OVA) sustained for one minute in the breathing zone; and
- Remote potential exists for physical contact or inhalation of petroleum hydrocarbons or inhalation of organic vapors during work operations.

11.1.2 Level C

The following criteria determine Level C protection:

- Air monitoring readings up to 10 ppm above background as detected by an OVA sustained for one minute in the breathing zone; and
- Potential exists for physical contact or inhalation of petroleum hydrocarbons or inhalation of organic vapors during work operations.

11.2 PERSONAL PROTECTION EQUIPMENT

The following would be the personal equipment for each level of protection as a minimum requirement:

11.2.1 Level D

- Coveralls or other appropriate clothing;
- Gloves (discretionary);
- Safety glasses;
- Leather or chemical resistant boots or shoes with steel toe and shank;
- Hard hat; and
- Ear protection (based on noise monitoring).

11.2.2 Level C

- Tyvek clothing;
- Chemical-resistant gloves;
- Full-face or half-face air-purifying canister equipped respirator (MSHA/NIOSH approved) available at work area;
- Safety glasses;
- Leather or chemical resistant boots or shoes with steel toe and shank;
- Hard hat; and
- Ear protection (based on noise monitoring).

11.3 LEVELS OF PROTECTION FOR WORK ACTIVITIES

Level D attire will be worn during the majority of the site work and where the potential exists for workers to contaminated groundwater, soil, or be exposed to organic vapors at the site.

Upgrading and downgrading of PPE will result if air monitoring results warrant and/or at the discretion of the SHSO. The SHSO will monitor the use and effectiveness of PPE during site work, as well as require that site workers inspect their PPE for proper fit and performance. Level D attire is the highest level of worker protection expected to be warranted during work activities.

12.0 DECONTAMINATION

Elements of the decontamination process and the decontamination area have been designed so as to minimize adverse environmental impacts. The procedures found in this section will be implemented under the direct supervision of the SHSO. The SHSO will monitor the decontamination practices of site personnel and evaluate effectiveness. The decontamination procedures that follow have been chosen based on the contaminants of concern, tasks to be completed, and previous experience.

12.1 PERSONNEL DECONTAMINATION

Personnel in Level D and Level C attire will be required to dispose of any gloves (cloth or chemical resistant), Tyveks (if applicable), and/or boot covers, and wash their hands before leaving the site. Gloves and/or boot covers will be disposed of by the SHSO.

12.1.1 Level C Decontamination Steps

Step 1	Outer Glove Wash
Step 2	Outer Glove Rinse
Step 3	Tape Removal
Step 4	Outer Glove Removal
Step 5*	Inner Glove Rinse*
Step 6	Tyvek Removal
Step 7	Safety Boot Wash
Step 8	Safety Boot Rinse
Step 9*	Inner Glove Removal*
Step 10	Remove Respirator if Worn
Step 11	Thoroughly Wash Hands and Face

12.1.2 Level D Decontamination Steps

Step 1	Remove Outer Garments (i.e., coveralls)
Step 2	Remove Outer Gloves
Step 3*	Remove Inner Gloves*
Step 4	Thoroughly Wash Hands and Face

***Note:** Inner gloves will be included as a part of these respective PPE ensembles if the SHSO so warrants.

Wastewater generated during personnel decontamination will be collected and stored on site in drums or other appropriate containers with contents identified and dated. This

water will be shipped for treatment through the nearest groundwater remediation treatment system.

12.2 EQUIPMENT DECONTAMINATION

Monitoring equipment will be decontaminated with a phosphate-free soap and water. Wastewater generated during equipment decontamination will be collected and stored on site in drums or other appropriate containers labeled with the site name, media (soil/groundwater), date, and contractor name.

12.3 WASTEWATER DISPOSAL

Upon completion of all necessary personnel and equipment decontamination at the site, the decontamination fluids will be treated through the IWTP. An IWTP disposal chit will be obtained from MCAS Cherry Point EAD prior to disposal at the IWTP.-

13.0 EMERGENCY RESPONSE

The following section provides information on personnel roles, lines of authority, and communications; safe distances and places of refuge; evacuation routes and procedures; and procedure for containing/collecting spills. A list of emergency phone numbers is provided on Figure 10-3. This list will be posted and updated as necessary in the MCAS site trailer.

13.1 PERSONNEL ROLES, LINES OF AUTHORITY, AND COMMUNICATIONS

The primary Emergency Coordinator (EC) for this site is the SS. In the event an emergency occurs, the SS or the highest-ranking employee on site will serve as the EC. The EC will determine the nature of the emergency and take appropriate action.

13.1.1 Responsibilities and Duties

It is recognized that the structure of the “Incident Command System” will change as additional response organizations are added. The Rhēa Team will follow procedures as directed by the fire department, Local Emergency Planning Committee (LEPC), and state and federal agencies, as required. The Rhēa Team will defer to the first on-scene local Fire Department individual with responsibility of taking command of the incident scene.

13.1.2 On-Site Emergency Coordinator Duties

The on-site EC is responsible for implementing and directing the emergency procedures. The EC will immediately contact the MCAS Fire Department for assistance in the event of a spill or release.

Initially, emergency personnel and their communications will be coordinated through the EC. Specific duties of the EC are as follows:

- Identify the source and character of the incident, type, and quantity of release. Assess possible hazards to human health or the environment that may result directly from the problem or its control;
- Discontinue operations in the vicinity of the incident if necessary to minimize the potential that fires, explosions, or spills recur or spread to other parts of the site. While operations are dormant, monitor for leaks, pressure build-up, gas generation, or ruptures in valves, pipes, or other equipment, where appropriate;
- Notify the Navy On-Scene Coordinator (NOSC) if outside emergency response help is necessary to control the incident;
- Direct on-site personnel to control the incident until, if necessary, outside help arrives;
- Verify that the building or area where the incident occurred and the surrounding area are evacuated, and shut off possible ignition sources, only if shut off can be achieved safely and is appropriate;
- If fire or explosion is involved, notify Local Fire Department, (911)
Important Note: If dialing 911 from a cell phone, the 911 call center in New Bern (or Carteret) will be contacted. Dialing 911 on a base phone will contact the MCAS Cherry Point 911 operator.
- Notify the ROICC;
- Notify the Rhēa PM.; and
- Notify the MCAS EAD and NAVFAC RPM.

If the incident may threaten human health or the environment outside of the site, the EC should immediately determine whether evacuation of the area outside of the site might be necessary and, if so, notify the Police Department and the on-site fire, safety, and rescue offices (See Figure 10-3).

When required (as determined by the NOSC and EAD), notify the National Response Center (NRC). The following information should be provided to NRC:

- Name and telephone number;
- Name and address of facility;
- Time and type of incident;
- Name and type of materials involved, if known;
- Extent of injuries; and
- Possible hazards to human health or the environment outside of the facility.

The emergency number for the NRC is **800-424-8802**.

If hazardous waste has been released or produced through control of the incident, the following steps shall occur:

- Waste is collected and contained;
- Containers of waste are removed or isolated from the immediate site of the emergency;
- Treatment or storage of the recovered waste, contaminated soil or surface water, or any other material that results from the incident or its control is provided;
- Check that no waste that is incompatible with released material is treated or stored at the site until cleanup procedures are completed;
- Check that all equipment used is decontaminated, recharged, and fit for its intended use before operations are resumed;
- Notify the USEPA Regional Administrator that cleanup procedures have been completed and that all emergency equipment is fit for its intended use before resuming operations in the affected area of the facility;

- Record time, date, and details of the incident, and submit a written report to the USEPA Regional Administrator. Report is due to USEPA within 15 days of the incident; and
- Perform the post-incident evaluation and response critique and submit a written report to the USEPA Regional Health and Safety Director within 30 days of the incident conclusion.

13.2 EMERGENCY RESPONSE EQUIPMENT

Before work activities begin, the following emergency equipment will be stored at the MCAS site trailer and tested to verify working order:

- First aid kit (16-unit);
- Air horn;
- Emergency eyewash station (Compliant with ANSI Standard Z358.1-1990);
- 20 pound fire extinguisher (ABC-type);
- Additional Tyvek and other PPE, safety glasses, hard hats, hearing protection, and respirators;
- Water for washing hands and face; and
- Emergency Response Equipment including oil sorbent pads and four sacks of petroleum/oil absorbent material.

Other equipment used for the routine implementation of the worker health and safety protection and monitoring programs will be made available as needed to support emergency response activities.

13.3 SAFE DISTANCES AND PLACES OF REFUGE

No single recommendation can be made for evacuation or safe distances because of the wide variety of emergencies that could occur. Safe distances will be determined at the time of the emergency based on a combination of site and incident-specific criteria. The following measures are established to serve as general guidelines.

In the event of minor hazardous materials releases (small spills of low toxicity), workers in the affected area will initially evacuate at least 50 feet in all directions to allow for cleanup and to prevent exposure. After initial assessment of the extent of the release and potential hazards, the EC or his designee will determine the specific boundaries for evacuation. Appropriate steps such as caution tape, rope, traffic cones, barricades, or personal monitors will be used to secure the boundaries.

In the event of a major hazardous materials release (large spills of high toxicity/greater than 55 gallons), workers will be evacuated from the site. If there are individuals in the area other than Rhēa employees, site personal will meet at the site entrance for a head count and to wait further instructions.

If the incident may threaten the health or safety of the surrounding community, the public will be informed and, if necessary, evacuated from the area. The EC, or his designee, will inform the proper agencies in the event that an evacuation is necessary. Places of refuge will be established prior to the commencement of activities. These areas must be identified for the following incidents:

- Chemical Release;
- Fire/explosion;
- Power loss;
- Medical emergency; and
- Hazardous weather.

13.4 EVACUATION ROUTES AND PROCEDURES

Emergencies require prompt and deliberate action. In the event of an emergency, it will be necessary to follow an established set of procedures. Such established procedures will be followed as closely as possible. In specific emergency situations, the EC may deviate from the procedures to provide a more effective plan for bringing the situation under control. The EC is responsible for determining which situation requires site evacuation.

13.4.1 Evacuation Signals and Routes

Two-way radio communications and an air horn will be used to notify employees of the necessity to evacuate an area or building involved in a release/spill of a hazardous material.

13.4.2 Evacuation Procedures

In the event evacuation is necessary, the following actions will be taken:

- The emergency signal will be activated;
- No further entry of visitors, contractors, or trucks will be permitted. Vehicle traffic within the site will cease in order to allow safe exit of personnel and movement of emergency equipment;

- Shut off machinery and equipment if safe to do so;
- Rhēa on-site personnel, visitors, and contractors on site will assemble at the entrance to the site for a head count and await further instruction from the SHSO;
- Contract personnel and visitors will be accounted for. A final tally of persons will be made by the SHSO or designee. No attempt to find persons not accounted for will involve endangering lives of Rhēa or other employee's by reentry into emergency areas;
- The security guard will aid in accounting for visitors, contractors, and truck drivers by reference to sign-in sheets available from the site trailer;
- The SHSO or a designee will be assigned to be available at the entrance to direct and brief emergency responders; and
- Reentry into the site will be made only after clearance is given by the SHSO. At his direction, a signal or other notification will be given for reentry into the site.

13.5 PROCEDURE FOR CONTAINING / COLLECTING SPILLS

The initial response to a spill or discharge will be to protect human health and safety, and the environment. Identification, containment, treatment, and disposal assessment will be the secondary response.

If a chemical spill is not contained within a dike or sump area, an area of isolation will be established around the spill. The size of the area will generally depend on the size of the spill and the materials involved. If the spill is large (greater than 55 gallons) and involves a tank or a pipeline rupture, an initial isolation of at least 100 feet in all directions will be used. Small spills (less than or equal to 55 gallons) or leaks from a tank or pipe will require evacuation of at least 50 feet in all directions to allow cleanup and repair and to prevent exposure. When any spill occurs, only those persons involved in overseeing or performing emergency operations will be allowed within the designated hazard area. If possible, the area will be roped or otherwise blocked off.

If the spill results in the formation of a toxic vapor cloud (by reaction with the surrounding materials or by outbreak of fire) and its release (due to high vapor pressures under ambient

conditions), further evacuation will be enforced. In general an area at least 500 feet wide and 1,000 feet long will be evacuated downwind if volatile materials are spilled.

If an incident may threaten the health or safety of the surrounding community, the public will be informed and possibly evacuated from the area. The on-site EC will inform the proper agencies in the event that this response is necessary.

13.6 FIRES

Rhēa personnel and subcontractors are not trained professional firefighters. Therefore, if there is any doubt that a fire can be quickly contained and extinguished, personnel will vacate the area and immediately contact the MCAS Fire Department.

The following procedures will be used to prevent the possibility of fires and resulting injuries:

- Sources of ignition will be kept away from where flammable materials are handled or stored;
- The air will be monitored for explosive atmospheres before and during hot work and periodically where flammable materials are present. Hot work permits will be required and displayed for all such work;
- “No Smoking” signs will be conspicuously posted in areas where flammable materials are present;
- Fire extinguishers will be placed in all areas where a fire hazard may exist; and
- Before workers begin operations in an area, the EC will give instructions on egress procedures and assembly points.

The following procedures will be used in the event of a fire:

- Workers who see a fire will notify the EC who will contact the local Fire Department;
- When the emergency horn sounds, workers will disconnect electrical equipment in use (if possible) and proceed off site; and

- When a small fire has been extinguished by a worker, the EC will be notified.

Small Fires: In the event of a small fire at the site, the EC will, at a minimum, take the following actions:

- Immediately notify the MCAS Fire Department;
- Evacuate all unnecessary personnel from the area to an upwind location, if possible;
- Attempt, using properly protected personnel, to extinguish fire using portable fire extinguishers or by smothering; and
- Request emergency response assistance (ambulance, fire, hospital, poison control center) as needed for any injuries or exposures to hazardous chemicals.

Large Fires: In the event of a large or small fire that cannot be extinguished, the SS/SHSO or EC will undertake the following actions:

- Immediately notify the MCAS Fire Department;
- Evacuate all personnel from the area of the fire, preferably to an upwind location;
- Order the appropriate level of protective clothing; and
- Notify the fire department and other emergency response agencies.

Evacuation Procedures: In the event that the EC should declare an evacuation, all personnel would be required to exit the defined work area to an upwind location near the site perimeter or beyond. Moreover, the evacuation procedures will be reviewed during site-specific training.

13.7 INCLEMENT WEATHER CONDITIONS

Inclement weather conditions may occur without warning. It will be the responsibility of the EC to halt work due to eminent dangers. The EC will also be responsible for ordering the commencement of work once the danger has passed.

Work activities will not be started or continued when the following hazardous weather conditions are present:

- Lightning;
- Heavy rains; and
- High winds.

Personnel working in hazardous weather conditions will move to safe refuge. The EC will determine when it is necessary to evacuate the area and will coordinate these efforts with fire, police, and other agencies.

The EC will be responsible for assessing hazardous weather conditions and notifying personnel of specific contingency measures. Notifications will include:

- Rhēa PM;
- Rhēa Corporate Safety Manager;
- EAD and ROICC; and
- Local Civil Defense Organization (if necessary).

In the event of the potential for a hurricane to impact the work activities, the EC will implement the requirements of the Hurricane Preparation Plan (HPP), provided in Attachment B.

14.0 HAZARD COMMUNICATION PROGRAM

The Rhēa Hazard Communication Program complies with 29 CFR 1926.59/1910.1200. The MSDS sheets pertaining to materials known or suspected to be encountered at the project site can be obtained from the SHSO. A MSDS station is located at the MCAS site trailer. Most MSDS sheets were obtained from the Internet (not the manufacturer of the actual spilled contaminant) and are considered “generic.” MSDS sheets for more common materials typically used at project site (WD-40, motor oils, and cleaning surfactants) can be found in the General MSDS binder located at the MCAS site trailer.

Chemical and hazardous material containers will be properly labeled or tagged. Chemicals and hazardous materials transferred to other containers will be properly labeled to indicate the product stored within.

Site personnel will be provided training in reading and interpreting MSDS and labels. Personnel working with chemicals and/or hazardous materials will consult the MSDS and labels prior to using these materials.

Each subcontractor will be responsible for maintaining its Hazard Communications Program, list of chemicals and hazardous products, MSDS, and training.

15.0 MEDICAL SURVEILLANCE PROGRAM

In accordance with 29 CFR 1910.120(f), Rhēa is responsible for instituting a medical surveillance program for the following personnel:

- Employees who are or may be exposed to hazardous substances or health hazards at or above permissible exposure limits or, if there is no permissible limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year;
- Employees who will wear a respirator for 30 days or more a year as required by 29 CFR 1910.134; and
- Employees who are injured, become ill, or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation.

In addition, site workers (i.e., Rhēa employee or subcontractor employee) exhibiting symptoms relating to heat/cold stress or other work related physical disorder will be examined by his/her firm's licensed occupational physician as soon as practicable upon exhibiting these symptoms.

The Rhēa medical surveillance program is designed and will be implemented by a licensed occupational physician in accordance with 29 CFR 1910.120(f). Medical surveillance will include, at a minimum, the following procedures:

- Complete medical and work histories;
- Physical examination;
- Dermatology examination;
- Pulmonary function tests;
- Eye examination;
- Audiometric;
- Qualitative respirator fit test; and
- Urinalysis; and
- Blood chemistry.

FIGURES

FIGURE 1-1

SITE HEALTH AND SAFETY PLAN ACCEPTANCE FORM

**RHĒA ENGINEERS AND CONSULTANTS, INC.
OU1 SITE 83 SOIL DELINEATION SAMPLING
MCAS CHERRY POINT, NORTH CAROLINA**

We, the undersigned, hereby attest that we have reviewed the Site Health and Safety Plan and will follow the procedures, protocols, and practices it sets forth.

NAME	ORGANIZATION	SIGNATURE	DATE

**FIGURE 6-1
SIGN - IN LOG**

**RHEA ENGINEERS AND CONSULTANTS, INC.
OU1 SITE 83 SOIL DELINEATION SAMPLING
MCAS CHERRY POINT, NORTH CAROLINA**

VISITOR NAME	COMPANY NAME	DATE	TIME IN	TIME OUT	PURPOSE OF VISIT

FIGURE 6-2 DAILY SAFETY MEETING LOG

**RHEA ENGINEERS AND CONSULTANTS, INC.
OU1 SITE 83 SOIL DELINEATION SAMPLING
MCAS CHERRY POINT, NORTH CAROLINA**

Date: _____ Time: _____ HSO: _____

Safety Topics Presented

<i>Issue</i>	<i>Today's Work Areas</i>			
Chemicals of Concern				
Physical Hazards of Concern				
Special Concerns				

Attendees (Please Print)

FIGURE 9-1
SUPERVISOR'S ACCIDENT INVESTIGATION REPORT

RHEA ENGINEERS AND CONSULTANTS, INC.
OU1 SITE 83 SOIL DELINEATION SAMPLING
MCAS CHERRY POINT, NORTH CAROLINA

Check all that apply: ☐ Injury/Illness ☐ Fatality ☐ Complaint
☐ Not Work Related ☐ Auto Liability ☐ Auto Physical Damage
☐ General Liability ☐ Property Damage ☐ Environmental

Exact Date, Day, and Time of Incident: _____ ☐ am ☐ pm

Shift: ☐ 1st ☐ 2nd ☐ 3rd

TMS: _____
(Employee's Home Division/Regional Office/Subsidiary)

Address: _____
City State Zip

PROJECT IDENTIFICATION (Project Related Incidents Only)

☐ Regular Full Time ☐ Regular Part Time ☐ Temporary ☐ Non-Employee

Address: _____
City State Zip

Birth Date: _____ Age: _____ Social Security No.: _____ Sex: _____

Job Title: _____ Department: _____ Date Hired: _____

Length of Employment: ☐ In Training ☐ Months ☐ Years

Time in Job Class: ☐ In Training ☐ Months ☐ Years

Name of Employee's Direct Supervisor: _____

Supervision at time of accident: ☐ Directly Supervised ☐ Indirectly Supervised ☐ Not Supervised

Specific location where accident occurred: _____

_____ ☐ MEC Facility ☐ Project Site ☐ Not Supervised ☐ Other _____

FIGURE 9-1 (continued)

SUPERVISOR'S ACCIDENT INVESTIGATION REPORT

To whom was incident reported?: _____ When?: _____

Witness Name/Address: _____

Witness Job Title/Reason in Area: _____

Describe Employee's job duties being performed when injured: _____

Describe fully the events which resulted in the accident/injury/illness: _____

Describe the injury/illness in detail; indicate part of body affected: _____

Name of object/substance which directly injured employee: _____

Has/will employee seek treatment?: ☐ Yes ☐ No Did Employee Die? ☐ Yes ☐ No

Name/Address of Hospital/Doctor: _____

Describe treatment given: _____

Was employee able to return to work?: ☐ Yes ☐ No

If YES: ☐ Regular Work ☐ Work with restricted activities

Restriction: _____

If NO: Date lost time began: _____ Date/Est. Date to Return: _____

FIGURE 9-1 (continued)

SUPERVISOR'S ACCIDENT INVESTIGATION REPORT

Specify personal protective equipment used by injured employee: _____

What training or instruction had been given?: _____

How could this accident have been prevented? _____

Corrective Action: _____

Signature _____ (Supvr/Manager)

Date _____

Signature _____ (Safety Officer)

Date _____

Signature _____ (Project Manager)

Date _____

DISTRIBUTION

Original to: Division Secretary at Employee's Home Office

Copy to: ☐ Corporate Health & Safety

☐ Regional Health & Safety Manager

☐ Project Manager

☐ Site Safety File

FIGURE 9-2
EMPLOYEE INJURY REPORT

RH&A ENGINEERS AND CONSULTANTS, INC.
OU1 SITE 83 SOIL DELINEATION SAMPLING
MCAS CHERRY POINT, NORTH CAROLINA

Check all that apply: ☐ Injury/Illness ☐ Fatality ☐ Complaint
☐ Not Work Related ☐ Auto Liability ☐ Auto Physical Damage
☐ General Liability ☐ Property Damage ☐ Environmental

Date, Day, and Time of Incident: _____ ☐ am ☐ pm

Your Name: _____ Your Employee No.: _____

Home Address: _____ Home Phone No.: () _____

Birth Date: _____ Age: _____ Social Security No.: _____ Sex: _____

Accident location (if project related, give Project No., Client, Address, and Phone No.):

On premises? ☐ Yes ☐ No

Business Name/Address: _____

How did accident occur?: _____

Was medical attention required?: ☐ Yes ☐ No

Did you return to work?: ☐ Yes ☐ No Your usual job?: ☐ Yes ☐ No

If not, explain: _____

Was the accident reported to a supervisor?: ☐ Yes ☐ No

Supervisor's Name: _____

Employee's Signature

Date

FIGURE 10-1 ROUTE TO PRIMARY MEDICAL FACILITY

RH&A ENGINEERS AND CONSULTANTS, INC. OU1 SITE 83 SOIL DELINEATION SAMPLING MCAS CHERRY POINT, NORTH CAROLINA

Craven Regional Medical Center

2000 Neuse Blvd.

P.O. Box 12157

New Bern, NC 28561

Emergency # 911

Non-Emergency # (252) 633-8111

Directions to hospital:

From the main gate, turn west onto SR 101 (Fontana Blvd.), bear right onto RT US 70 West (W. Main St.), follow 70 West to SR 1200 (Pembroke Road), turn left onto 1st Street, turn left onto US 17 (US 70 Bus/SR 55/Neuse Blvd.), turn right onto Hospital Drive, hospital is on the left.

Travel Time: Approx. 32 min.



FIGURE 10-2 ROUTE TO SECONDARY MEDICAL FACILITY

RH&A ENGINEERS AND CONSULTANTS, INC. OU1 SITE 83 SOIL DELINEATION SAMPLING MCAS CHERRY POINT, NORTH CAROLINA

Carteret General Hospital

3500 Arendell Street

P.O. Drawer 1619

Morehead City, NC 28557

Emergency # 911

Non-Emergency # (252) 808-6000

Directions to hospital:

Directions to Carteret General Hospital: From the main gate, turn west onto SR 101 (Fontana Blvd.), turn left onto RT US 70 East (E. Main St.), follow 70 East to North 35th Street, turn left into the hospital

Travel Time: Approx. 37 min.

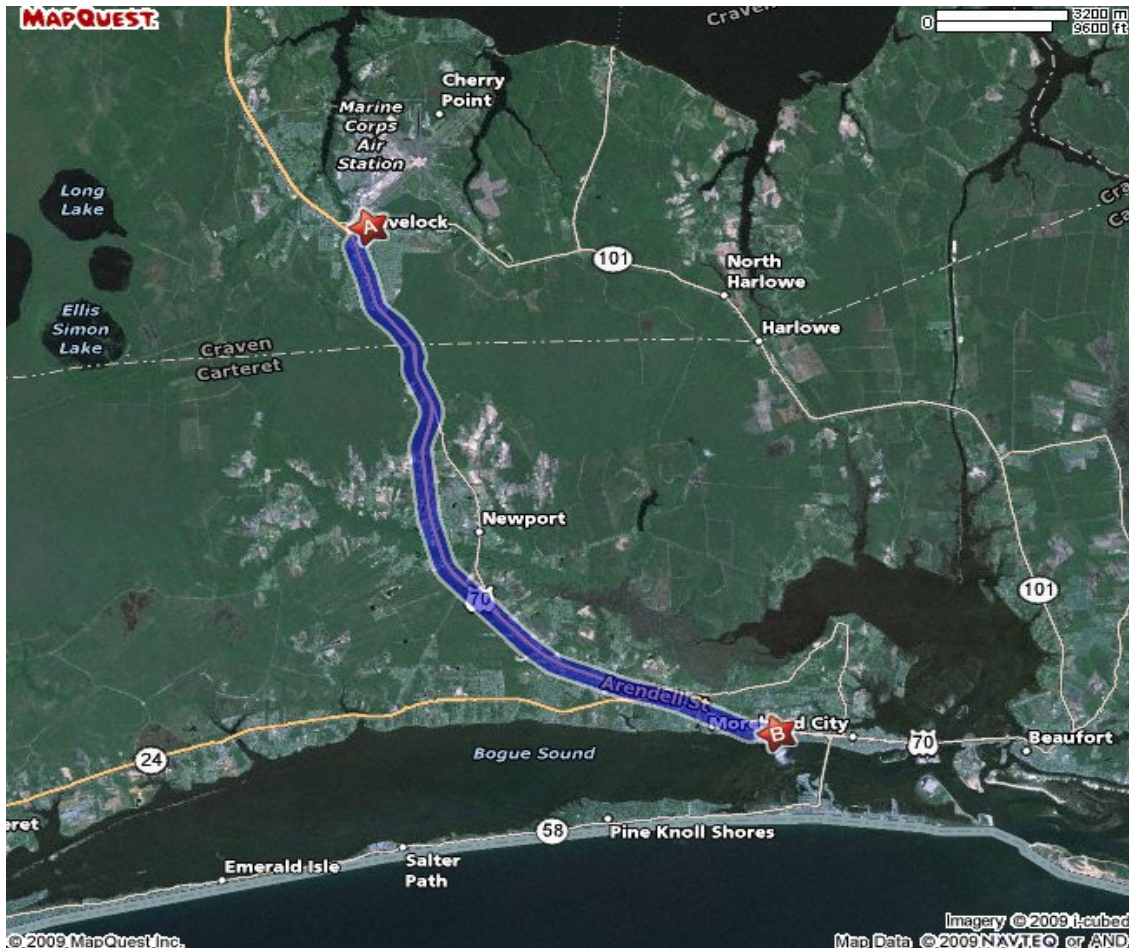


FIGURE 10-3
EMERGENCY TELEPHONE NUMBERS

RHEA ENGINEERS AND CONSULTANTS, INC.
OU1 SITE 83 SOIL DELINEATION SAMPLING
MCAS CHERRY POINT, NORTH CAROLINA

MCAS Cherry Point On-Site Emergency Telephone Numbers
--

Fire	252-466-3333
Security	252-466-3615
Safety	252-466-0102
ROICC (Karen Boyd)	252-466-4731

Off-Site Emergency Telephone Numbers

Site Superintendent / SHSO (Cell)	724-462-4202
Project Manager (Cell)	724-316-6593
Craven Regional Medical Center	252-633-8111
Carteret General Hospital	252-808-6000
Rescue Squad	911
Fire	911
Police	911
Poison Control	(800) 848-6946
ChemTrec/Spill Response	(800) 424-9300
National Response Center	(800) 424-8802

Important Notes:

If dialing 911 from a cell phone, the 911 call center in New Bern (or Carteret) will be contacted.

Dialing 911 on a base phone will contact the MCAS Cherry Point 911 operator.

To report a spill or fire, the MCAS Cherry Point 911 operator should be contacted.

The 911 call center can redirect cell phone calls to the MCAS Cherry Point 911 operator.

APPENDIX A

EXPERIENCE MODIFICATION RATING



RATING AND UNDERWRITING REFERENCE

PA Merit Adjustment

DATA SEARCHES

- Rating Values and Classes

- Experience Rating/
Merit Rating

- Underwriting Guide

- Switch to DE

- Return to UL

- Log Out

Bureau File Number: 3080670

County: ALLEGHENY

Employer Name: RHEA ENGINEERS & CONSULTANTS

Address: 4951 WILLIAM FLYNN HWY SUITE 1
GIBSONIA PA 15044

Governing Class: 955

Effective Date: 11/01/2008

Issue Date: 10/19/2008

Expiration Date: 11/01/2009

Card Number: 000001

XREF: 9885

Class	Rating Value	Description
9885		MERIT ADJUSTMENT - 5 % CREDIT

Merit History	Effective Date
9885 - Credit	01/28/2008
9885 - Credit	01/28/2007
9885 - Credit	01/28/2006
9885 - Credit	01/28/2005

[Back](#)
[View Bureau History/Authorized Classes](#)


APPENDIX B

MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheet

Benzo[a]pyrene, 98%

ACC# 37175

Section 1 - Chemical Product and Company Identification

MSDS Name: Benzo[a]pyrene, 98%

Catalog Numbers: AC105600000, AC105600010, AC105601000, AC377200000, AC377200010, AC377201000
AC377201000

Synonyms: 3,4-Benzopyrene; 3,4-Benzpyrene; Benzo[def]chrysene.

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
50-32-8	Benzo[a]pyrene	>96	200-028-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to brown powder.

Danger! May cause harm to the unborn child. May impair fertility. May cause eye, skin, and respiratory tract irritation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Cancer hazard. May cause allergic skin reaction. May cause heritable genetic damage.

Target Organs: Reproductive system, skin.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin. May cause an allergic reaction in certain individuals.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. May be harmful if inhaled.

Chronic: May cause cancer in humans. May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If

conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Benzo[a]pyrene	0.2 mg/m ³ TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m ³ TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m ³ IDLH (listed under Coal tar pitches).	0.2 mg/m ³ TWA (as benzene soluble fraction) (listed under Coal tar pitches).

OSHA Vacated PELs: Benzo[a]pyrene: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements

or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: yellow to brown

Odor: faint aromatic odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 495 deg C @ 760 mm Hg

Freezing/Melting Point: 175 - 179 deg C

Decomposition Temperature: Not available.

Solubility: 1.60x10⁻³ mg/l @25°C

Specific Gravity/Density: Not available.

Molecular Formula: C₂₀H₁₂

Molecular Weight: 252.31

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 50-32-8: DJ3675000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 50-32-8:

- **ACGIH:** A2 - Suspected Human Carcinogen
- **California:** carcinogen, initial date 7/1/87
- **NTP:** Suspect carcinogen
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in humans. Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series:

CAS# 50-32-8: waste number U022.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NOT REGULATED FOR DOMESTIC TRANSPORT	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL (Benzo{a} pyrene)
Hazard Class:		9
UN Number:		UN3077
Packing Group:		III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 50-32-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 50-32-8: 1 lb final RQ; 0.454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 50-32-8: immediate, delayed.

Section 313

This material contains Benzo[a]pyrene (CAS# 50-32-8, >96%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. CAS# 50-32-8 is listed as a Priority Pollutant under the Clean Water Act.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 50-32-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Benzo[a]pyrene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 50-32-8: 0.06 æg/day NSRL

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T N

Risk Phrases:

R 43 May cause sensitization by skin contact.

R 45 May cause cancer.

R 46 May cause heritable genetic damage.

R 60 May impair fertility.

R 61 May cause harm to the unborn child.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 50-32-8: No information available.

Canada - DSL/NDSL

CAS# 50-32-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 50-32-8 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 9/02/1997

Revision #7 Date: 6/30/2006

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

International Chemical Safety Cards

BENZ(a)ANTHRACENE

ICSC: 0385

BENZ(a)ANTHRACENE

1,2-Benzoanthracene

Benzo(a)anthracene

2,3-Benzphenanthrene

Naphthanthracene

 $C_{18}H_{12}$

Molecular mass: 228.3

CAS # 56-55-3

RTECS # CV9275000

ICSC # 0385

EC # 601-033-00-9

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.		Water spray, powder. In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		AVOID ALL CONTACT!	
• INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
• SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
• EYES		Safety goggles, face shield, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth.
SPILLAGE DISPOSAL		STORAGE	PACKAGING & LABELLING
Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place (extra personal protection: complete protective clothing including self-contained breathing apparatus).		Well closed.	T symbol R: 45 S: 53-45
SEE IMPORTANT INFORMATION ON BACK			
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International Chemical Safety Cards

BENZ(a)ANTHRACENE

ICSC: 0385

I M P O R T A N T D A T A	PHYSICAL STATE; APPEARANCE: COLOURLESS TO YELLOW-BROWN FLUORESCENT FLAKES OR POWDER.		ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation, through the skin and by ingestion.	
	PHYSICAL DANGERS: Dust explosion possible if in powder or granular form, mixed with air.		INHALATION RISK: Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.	
	CHEMICAL DANGERS:		EFFECTS OF SHORT-TERM EXPOSURE:	
	OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV not established.		EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: This substance is probably carcinogenic to humans.	
PHYSICAL PROPERTIES	Sublimation point: 435°C Melting point: 162°C Relative density (water = 1): 1.274		Solubility in water: none Vapour pressure, Pa at 20°C: 292 Octanol/water partition coefficient as log Pow: 5.61	
ENVIRONMENTAL DATA	In the food chain important to humans, bioaccumulation takes place, specifically in seafood.			
NOTES				
This substance is one of many polycyclic aromatic hydrocarbons - standards are usually established for them as mixtures, e.g., coal tar pitch volatiles. However, it may be encountered as a laboratory chemical in its pure form. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken. Do NOT take working clothes home. Tetraphene is a common name.				
ADDITIONAL INFORMATION				
ICSC: 0385			BENZ(a)ANTHRACENE	
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International Chemical Safety Cards

BENZO(B)FLUORANTHENE

ICSC: 0720

BENZO(B)FLUORANTHENE
Benzo(e)acephenanthrylene
2,3-Benzofluoroanthene
 $C_{20}H_{12}$
Molecular mass: 252.3

CAS # 205-99-2
RTECS # CU1400000
ICSC # 0720

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray, powder.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE! AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
• INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
• SKIN	MAY BE ABSORBED!	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention. Wear protective gloves when administering first aid.
• EYES		Safety goggles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work.	Wear protective gloves when inducing vomiting. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.
SPILLAGE DISPOSAL		STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.		Provision to contain effluent from fire extinguishing. Tightly closed.	Unbreakable packaging; put breakable packaging into closed unbreakable container.
SEE IMPORTANT INFORMATION ON BACK			
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International Chemical Safety Cards

BENZO(B)FLUORANTHENE

ICSC: 0720

	PHYSICAL STATE; APPEARANCE:	ROUTES OF EXPOSURE:
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I M P O R T A N T D A T A	COLOURLESS TO YELLOW CRYSTALS.		The substance can be absorbed into the body by inhalation of its aerosol and through the skin.	
	PHYSICAL DANGERS:		INHALATION RISK:	
	CHEMICAL DANGERS:		Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.	
	Upon heating, toxic fumes are formed.		EFFECTS OF SHORT-TERM EXPOSURE:	
	OCCUPATIONAL EXPOSURE LIMITS (OELs):		EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:	
	TLV not established.		This substance is possibly carcinogenic to humans.	
PHYSICAL PROPERTIES	Melting point: 168°C Solubility in water: none		Vapour pressure, Pa at 20°C: <10 Octanol/water partition coefficient as log Pow: 6.04	
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to the total environment. In the food chain important to humans, bioaccumulation takes place, specifically in oils and fats.			
NOTES				
Depending on the degree of exposure, periodic medical examination is indicated. Data are insufficiently available on the effect of this substance on human health, therefore utmost care must be taken. Do NOT take working clothes home.				
ADDITIONAL INFORMATION				
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SUPELCO INC -- 48574, DIBENZO (A,H) ANTHRACENE 0.1G -- 6810-00N032523

===== Product Identification =====

Product ID:48574, DIBENZO (A,H) ANTHRACENE 0.1G
MSDS Date:12/19/1985
FSC:6810
NIIN:00N032523
MSDS Number: BNSSL
=== Responsible Party ===
Company Name:SUPELCO INC
Address:SUPELCO PARK
City:BELLEFONTE
State:PA
ZIP:16823-0048
Country:US
Info Phone Num:814-359-3441
Emergency Phone Num:814-359-3441
CAGE:54968
=== Contractor Identification ===
Company Name:SIGMA-ALDRICH INC.
Address:3050 SPRUCE STREET
Box:14508
City:ST. LOUIS
State:MO
ZIP:63103
Country:US
Phone:314-771-5765/414-273-3850X5996
CAGE:54968

===== Composition/Information on Ingredients =====

Ingred Name:DIBENZ A,H ANTHRACENE
CAS:53-70-3
RTECS #:HN2625000
EPA Rpt Qty:1 LB
DOT Rpt Qty:1 LB

===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:YES IARC:YES OSHA:NO
Health Hazards Acute and Chronic:REPORTED ANIMAL CARCINOGEN.
Explanation of Carcinogenicity:DIBENZ(A,H) ANTHRACENE: GROUP 2A(IARC),
ANTICIPATED TO BE CARCINOGEN (NTP).
Effects of Overexposure:NONE SPECIFIED BY MANUFACTURER.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

===== First Aid Measures =====

First Aid:EYES: FLUSH WITH WATER FOR AT LEAST 15 MIN. CONTACT A
PHYSICIAN. SKIN: FLUSH WITH LARGE VOLUMES OF WATER. CONTACT A
PHYSICIAN. INHAL: IMMED MOVE TO FRESH AIR. INGEST: CONTACT A
PHYSICIAN.

===== Fire Fighting Measures =====

Lower Limits:1%
Extinguishing Media:WATER, CO2, DRY CHEMICAL.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT .

===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP MATERIAL. AVOID GENERATING DUST.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:STORE IN SEALED CONTAINER IN COOL, DRY
LOCATION. AVOID GENERATING DUST.
Other Precautions:REPORTED CANCER HAZARD. AVOID EYE OR SKIN CONTACT.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR NIOSH/MSHA APPROVED SCBA.
Ventilation:USE ONLY IN WELL VENTILATED AREA.
Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:CHEMICAL WORKERS GOGGLES .
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
NONE SPECIFIED BY MANUFACTURER.

===== Physical/Chemical Properties =====

HCC:T6
Boiling Pt:B.P. Text:509F,265C
Vapor Density:9.60
Spec Gravity:>1(H2O=1)
Appearance and Odor:OFF-WHITE TO YELLOW-GREEN CRYSTALLINE

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
OXIDIZING AGENTS.

===== Disposal Considerations =====

Waste Disposal Methods:COMPLY WITH ALL APPLICABLE FEDERAL, STATE, OR
LOCAL REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

SUPELCO INC -- 48499, INDENO (1,2,3-CD) PYRENE 10MG -- 6810-00N032522

===== Product Identification =====

Product ID:48499, INDENO (1,2,3-CD) PYRENE 10MG
MSDS Date:06/06/1985
FSC:6810
NIIN:00N032522
MSDS Number: BNSSK
=== Responsible Party ===
Company Name:SUPELCO INC
Address:SUPELCO PARK
City:BELLEFONTE
State:PA
ZIP:16823-0048
Country:US
Info Phone Num:814-359-3441
Emergency Phone Num:814-359-3441
CAGE:54968
=== Contractor Identification ===
Company Name:SIGMA-ALDRICH INC.
Address:3050 SPRUCE STREET
Box:14508
City:ST. LOUIS
State:MO
ZIP:63103
Country:US
Phone:314-771-5765/414-273-3850X5996
CAGE:54968

===== Composition/Information on Ingredients =====

Ingred Name:INDENO 1,2,3-CD PYRENE
CAS:193-39-5
RTECS #:NK9300000
EPA Rpt Qty:100 LBS
DOT Rpt Qty:100 LBS

===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:YES IARC:YES OSHA:NO
Health Hazards Acute and Chronic:REPORTED ANIMAL CARCINOGEN.
Explanation of Carcinogenicity:INDENO(1,2,3-CD) PYRENE: GROUP 2B(IARC),
ANTICIPATED TO BE CARCINOGEN (NTP).
Effects of Overexposure:NONE SPECIFIED BY MANUFACTURER.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

===== First Aid Measures =====

First Aid:EYES: FLUSH WITH WATER FOR AT LEAST 15 MIN. SKIN: FLUSH WITH
LARGE VOLUMES OF WATER. REMOVE CONTAMINATED CLOTHING. INHAL: MOVE
TO FRESH AIR. IF BREATHING STOPS, GIVE ARTF RESP. INGEST: IMMED
CONTACT A PHYSICIAN.

===== Fire Fighting Measures =====

Flash Point:400F,204C
Extinguishing Media:CO2, DRY CHEMICAL.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT .

===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP MATERIAL. AVOID GENERATING DUST.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:STORE IN SEALED CONTR IN COOL, DRY
LOCATION. KEEP AWAY FROM OXIDIZERS. STORE IN DRY, WELL VENTILATED
AREA.
Other Precautions:REPORTED CANCER HAZARD. AVOID EYE OR SKIN CONTACT.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT .

Ventilation:USE ONLY IN EXHAUST HOOD.
Protective Gloves:NEOPRENE GLOVES.
Eye Protection:CHEMICAL WORKERS GOGGLES .
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
NONE SPECIFIED BY MANUFACTURER.

===== Physical/Chemical Properties =====

HCC:T6
Melt/Freeze Pt:M.P/F.P Text:324F,162C
Vapor Pres:0.10
Appearance and Odor:YELLOW CRYSTALS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
OXIDIZING AGENTS. METALLIC SODIUM & POTASSIUM.

===== Disposal Considerations =====

Waste Disposal Methods:COMPLY WITH ALL APPLICABLE FEDERAL, STATE, OR
LOCAL REGULATIONS.

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International Chemical Safety Cards

DIELDRIN

ICSC: 0787

<div>DIELDRIN HEOD 1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro,endo,exo-1,4:5,8-dimethanonaphthalene C₁₂H₈Cl₆O Molecular mass: 381</div> <div>CAS # 60-57-1 RTECS # IO1750000 ICSC # 0787 UN # 2761 EC # 602-049-00-9</div>			
TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Liquid formulations containing organic solvents may be flammable.		In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION	Explosion hazard will depend on the solvent used or on the characteristics of the dust.		
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
• INHALATION	(see Ingestion).	Ventilation (not if powder).	Fresh air, rest. Refer for medical attention.
• SKIN	MAY BE ABSORBED! See Ingestion.	Protective gloves. Rubber boots.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
• EYES	Redness.	Safety goggles or face shield.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION	Convulsions. Dizziness. Headache. Nausea. Vomiting. Weakness.	Do not eat, drink, or smoke during work.	Do NOT induce vomiting. Rest. Refer for medical attention.
SPILLAGE DISPOSAL		STORAGE	PACKAGING & LABELLING
Sweep spilled substance into sealable containers. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment (extra personal protection: complete protective clothing including self-contained breathing apparatus).		Separated from food and feedstuffs. Cool. Dry.	Do not transport with food and feedstuffs. T+ symbol R: 25-27-40-48 S: 22-36/37-45 UN Hazard Class: 6.1 UN Packing Group: I Marine pollutant.
SEE IMPORTANT INFORMATION ON BACK			
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International Chemical Safety Cards

DIELDRIN

ICSC: 0787

I M P O R T A N T D A T A	PHYSICAL STATE; APPEARANCE: COLOURLESS CRYSTALS.		ROUTES OF EXPOSURE: The substance can be absorbed into the body through the skin and by ingestion.	
	PHYSICAL DANGERS:		INHALATION RISK: Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly on spraying.	
	CHEMICAL DANGERS: The substance decomposes on heating producing toxic and corrosive fumes (chlorine fumes, hydrogen chloride). Reacts with oxidants, concentrated mineral acids, acid acatalysts, metals (copper, iron). Attacks metal due to the slow formation of hydrogen chloride in storage.		EFFECTS OF SHORT-TERM EXPOSURE: The substance may cause effects on the central nervous system , resulting in convulsions. Medical observation is indicated.	
	OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV (as TWA): ppm; 0.25 mg/m ³ (skin) (ACGIH 1991-1992).		EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: The substance may be found in the human placenta.	
PHYSICAL PROPERTIES	Melting point: 175-176°C Relative density (water = 1): 1.62 Solubility in water: None		Vapour pressure, Pa at 20°C: 0.0004 Octanol/water partition coefficient as log Pow: 6.2	
ENVIRONMENTAL DATA	Dieldrin persists in the environment: 50% disappear after 4 to 7 years. This substance may be hazardous to the environment; special attention should be given to birds and water organisms. In the food chain important to humans, bioaccumulation takes place, specifically in aquatic organisms.			
NOTES				
Technical dieldrin (95%) consists of light tan flakes with a mild odour. Carrier solvents used in commercial formulations may change physical and toxicological properties. Do NOT take working clothes home. The recommendations on this Card also apply to ICSC # 0774 (aldrin). Alvit, Octalox, Quintox, Illoxol, Panoram D-31, Dieldrite, Dorytox, Compound 497 are trade names. <div>Transport Emergency Card: TEC (R)-61G53b</div>				
ADDITIONAL INFORMATION				
ICSC: 0787		DIELDRIN		
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International Chemical Safety Cards

CHLORDANE

ICSC: 0740

<p style="text-align: center;">CHLORDANE 1,2,4,5,6,7,8,8-Octachloro-2,3,3a,4,7,7a-hexahydro-4,7-methanoindene $C_{10}H_6Cl_8$ Molecular mass: 409.8</p> <p>CAS # 57-74-9 RTECS # PB9800000 ICSC # 0740 UN # 2996 EC # 602-047-00-8</p>			
TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible. Liquid formulations containing organic solvents may be flammable. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames.	Alcohol-resistant foam, powder, carbon dioxide.
EXPLOSION	Above 56°C explosive vapour/air mixtures may be formed. Explosion hazard will depend on the solvent used or on the characteristics of the dust.	Above 56°C closed system, ventilation.	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		PREVENT GENERATION OF MISTS! STRICT HYGIENE!	
• INHALATION	(see Ingestion).	Breathing protection.	Fresh air, rest. Refer for medical attention.
• SKIN	MAY BE ABSORBED!	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
• EYES	Redness.	Safety goggles or face shield, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION	Convulsions. Nausea. Vomiting.	Do not eat, drink, or smoke during work.	Do NOT induce vomiting. Rest. Refer for medical attention.
SPILLAGE DISPOSAL		STORAGE	PACKAGING & LABELLING
Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer (extra personal protection: complete protective clothing including self-contained breathing apparatus).		Separated from food and feedstuffs, strong bases. Cool. Dry.	Do not transport with food and feedstuffs. Xn symbol R: 21/22-40 S: 36/37 UN Hazard Class: 6.1 UN Packing Group: III Severe marine pollutant.
SEE IMPORTANT INFORMATION ON BACK			
ICSC: 0740		Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993	

International Chemical Safety Cards

CHLORDANE

ICSC: 0740

I M P O R T A N T D A T A	PHYSICAL STATE; APPEARANCE: LIGHT YELLOW TO AMBER VISCOUS LIQUID.	
	PHYSICAL DANGERS:	
	CHEMICAL DANGERS: The substance decomposes on heating and/or on burning and on contact with bases producing toxic fumes: chlorine fumes, hydrogen chloride, phosgene. Attacks plastic, rubber and coating.	
	OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV: ppm; 0.5 mg/m ³ (as TWA) (skin) (ACGIH 1991-1992). PDK: 0.01 mg/m ³ C (USSR 1977).	
	ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation of dusts from powder concentrates, through the skin especially from liquid formulations, and by ingestion. INHALATION RISK: Evaporation at 20°C is negligible; a nuisance-causing concentration of airborne particles can, however, be reached quickly when dispersed. EFFECTS OF SHORT-TERM EXPOSURE: Inhalation of dust may cause irritation. Exposure at high levels may result in disorientation, tremors, convulsions, respiratory failure and death. Medical observation is indicated. EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: This substance is possibly carcinogenic to humans.	
PHYSICAL PROPERTIES	Boiling point at 1.33 kPa: 175°C Relative density (water = 1): 1.59-1.63 Solubility in water: None	Vapour pressure, Pa at 25°C: 0.0013 Octanol/water partition coefficient as log Pow: 2.78
ENVIRONMENTAL DATA	Chlordane is persistent and rather immobile in soil. This substance may be hazardous to the environment; special attention should be given to fish in tropical areas. It is strongly advised not to let the chemical enter into the environment.	
NOTES		
The commercial product (technical chlordane) is a mixture containing 60 to 75% of the pure compound and 25 to 40% of related compounds. The chlorine content is 64-67%. Other melting points: cis-isomer: 106-107°C; trans-isomer: 104-105°C. All uses of this substance are increasingly restricted. Safe and equally effective alternatives should be prepared. Carrier solvents used in commercial formulations may change physical and toxicological properties. Do NOT take working clothes home. Aspon Chlordane, Belt, Corodane, Niran, Velsicol 1068, Toxichlor, Octachlor, Ortho-klor, Synklor, Topiclor, Toxichlor are trade names. Also consult ICSC # 0743 on heptachlor. Transport Emergency Card: TEC (R)-61G57c		
ADDITIONAL INFORMATION		
ICSC: 0740		CHLORDANE
© IPCS, CEC, 1993		
IMPORTANT LEGAL NOTICE:	Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.	

RM Number: 8469 (Renewals)

MSDS Number: 8469

RM Name: 4,4'-DDT

Issued: May, 1992

MATERIAL SAFETY DATA SHEET

**National Institute of Standards and Technology
Standard Reference Materials Program
Gaithersburg, Maryland 20899
(301) 975-2019**

SECTION I. MATERIAL IDENTIFICATION

Material Name: 4,4'-DDT

Description: This material is a polychlorinated, non-degradable pesticide. A unit of RM 8469 consists of one vial containing approximately 100 mg of 4,4'-DDT.

Other Designations: *p,p'*DDT; DDT; 1'1(2,2,2-trichloroethylidene)bis[4-chlorobenzene;
1,1,1-trichloro-2,2-bis(*p*-chlorophenyl)ethane; a,a-bis(*p*-chlorophenyl)-b,b,b-trichlorethane; benzene,
1,1'-(2,2,2-trichloroethylidene)bis(4-chloro); ethane, 1,1,1-trichloro-2,2-bis(*p*-chlorophenyl)-ethane;
 α,α -bis(*p*-chlorophenyl)- β,β,β -trichloroethane; dichlorodiphenyltrichloroethane; chlorophenothane; clofenotane; dicophane;
pentachlorin; *Agritan*; *Gesapon*; *Gesarex*; *Gesarol*; *Guesapon*; *Neocid*

Chemical Formula: $(\text{Cl}-\text{C}_6\text{H}_4)_2\text{-C-H-C-Cl}_3$

CAS Reg. No.: 50-29-3

DOT Classification: Class 6.1 Poison

Manufacturer/Supplier: Available from a number of suppliers.

SECTION II. HAZARDOUS INGREDIENTS

<u>Hazardous Component</u>	<u>Nominal Concentration</u>	<u>Limits and Toxicity Data</u>
4,4'-DDT	~ 100%	OSHA TLV: 1 mg/m ³ (skin) ACGIH TLV-TWA: 1 mg/m ³ NIOSH TWA (validated method): 0.5 mg/m ³ DFG MAK TWA: 1 mg/m ³ (total dust/skin) DFG MAK (30 Min Peak): 10 mg/m ³ (1 time/shift) Rabbit, Skin: LD ₅₀ : 300 mg/kg Rat, Skin: LD ₅₀ : 1931 mg/kg

Guinea Pig, Skin:

LD₅₀: 1000 mg/kg

Human, Oral:

TD_{LO}: 5 mg/kg

Infant, Oral:

LD_{LO}: 150 mg/kg

Man, Oral:

TD_{LO}: 6 mg/kg

Human, Oral:

LD_{LO}: 500 mg/kg

Human, Oral:

TD_{LO}: 16 mg/kg

Rat, Oral:

LD₅₀: 87 mg/kg

Mouse, Oral:

LD₅₀: 135 mg/kg

Dog, Oral:

LD₅₀: 150 mg.kg

Rabbit, Oral:

LD₅₀: 250 mg/kg

Guinea Pig, Oral:

LD₅₀: 150 mg.kg

Monkey, Oral:

LD₅₀: 200 mg/kg

Cat, Oral:

LD_{LO}: 250 mg/kg

HAZARDOUS INGREDIENTS CONTINUED

<u>Hazardous Component</u>	<u>Nominal Concentration</u>	<u>Limits and Toxicity Data</u>
4,4'-DDT	~ 100%	<p>Domestic Animal, Oral:</p> <p>LD_{LO}: 300 mg/kg</p> <p>Rat, Subcutaneous:</p> <p>LD₅₀: 1500 mg/kg</p> <p>Rabbit, Subcutaneous:</p> <p>LD₅₀: 250 mg/kg</p> <p>Guinea Pig, Subcutaneous:</p> <p>LD₅₀: 900 mg/kg</p> <p>Rat, Intravenous:</p> <p>LD₅₀: 68 mg/kg</p> <p>Mouse, Intravenous:</p> <p>LD₅₀: 68,500 µg/kg</p> <p>Rabbit, Intravenous:</p> <p>LD_{LO}: 50 mg/kg</p> <p>Monkey, Intravenous:</p>

LD_{LO}: 50 mg/kg

Dog, Intravenous:

LD_{LO}: 75 mg/kg

Rat, Intraperitoneal:

LD₅₀: 9100 µg/kg

Mouse, Intraperitoneal:

LD₅₀: 32 mg/kg

Man, Unreported:

LD_{LO}: 221 mg/kg

SECTION III. PHYSICAL/ CHEMICAL CHARACTERISTICS

4,4'-DDT

Appearance and Odor: A tasteless, almost odorless, white crystalline powder.

Molecular Weight: 354.49

Density: 1.56

Boiling Point: 260 °C

Melting Point: 108.5 - 109 °C

Vapor Pressure: 1.5×10^{-7} mmHg

Solubility in Water (vol/vol at 0 °C): Practically insoluble.

Solubility in Other Compounds (g/100 ml):	acetone	58
	benzene	78
	benzyl benzoate	42
	carbon tetrachloride	45
	chlorobenzene	74
	cyclohexanone	116
	95% alcohol	2
	ethyl ether	28
	gasoline	20
	isopropanol	3
	kerosene	8 - 10
	morpholine	75
	peanut oil	11
	pine oil	10 - 16

tetralin	61
tributyl phosphate	50

This material is freely soluble in pyridine and dioxane. The solubility in organic solvents increases sharply with with a temperature increase. **Insoluble** in dilute acids and alkalies.

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/A

(Method Used): N/A

Autoignition Temperature: N/A

Flammability Limits in Air (Volume %): UPPER: N/A
LOWER: N/A

Extinguishing Media: Use dry chemical, water spray of regular foam.

Special Fire Procedures: Fire-fighters should wear self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode and other protective clothing when fighting fires involving this material.

Unusual Fire and Explosion Hazards: This material is a negligible fire hazard when exposed to heat or flame. This material may burn but does not ignite readily. Containers may explode in the heat of a fire.

This material in the presence of strong oxidizers may cause a fire and explosion hazard.

SECTION V. REACTIVITY DATA

Stability: X Stable Unstable

Note: The unusual stability of this material has resulted in difficulties in residue removal from water, soil, and food mediums.

Conditions to Avoid: Keep this material from excessive temperatures and incompatible materials.

Incompatibility (Materials to Avoid): Dichlorodiphenyltrichloroethane with alkalies, alkaloid nicotine, bordeaux mixture (a fungicide and insecticide mixture made by adding slaked lime to a copper sulfate solution), clay, dolomite, or ferbam (dimethyldithiocarbamate) may cause a decomposition reaction.

See Section IV: Fire and Explosion Hazard Data.

Hazardous Decomposition or Byproducts: Thermal decomposition products may include toxic and corrosive fumes of chlorides and toxic oxides of carbon.

Hazardous Polymerization: Will Occur X Will Not Occur

SECTION VI. HEALTH HAZARD DATA

Route of Entry: X Inhalation X Skin X Ingestion

Health Hazards (Acute and Chronic): Ingestion can occur through oral administration or may result if sufficient amounts are absorbed from the lungs through inhalation. Repeated or prolonged inhalation may cause irritation of the nose, throat, and *mucous membranes*. A study of occupational exposure to DDT reported a higher frequency of white blood cells with chromosomal abnormalities among workers with high DDT blood levels. Menstrual irregularities are the most frequent complaint among migrant farm workers were observed in another study. Signs of liver and kidney damage can develop. Liver biopsy of 8 workers exposed to BHC (benzene hexachloride) and/or DDT for 5 - 13 years revealed chronic liver damage including *cirrhosis* (fibrosis with hardening caused by excessive formation of connective tissue followed by contraction) and *chronic hepatitis* (persistent inflammation of the liver). Liver *necrosis* (localized death of living tissue) has been reported in experimental animals.

Ingestion of large doses may induce prompt vomiting with nausea and diarrhea. Convulsions may alternate with periods of coma and partial paralysis. Death may be due to respiratory failure or *medullary paralysis* (paralysis of the pyramidal last part of the vertebrate brain, continuous posteriorly with the spinal cord). Complete recovery from sublethal doses may occur within 1 to 3 days, however, cases of weakness, paralysis and *ataxia* (an inability to coordinate voluntary muscular movements) were reported to have persisted for weeks.

Palpitations (rapid and strong throbbing), *tachycardia* (a rapid heart action) and irregular heart action have been noted in some cases of acute poisoning. DDT has been suspect in the development of *aplastic anemia* (anemia that is characterized by defective function of the blood-forming organs and is caused by toxic agents), *agranulocytosis* (an acute, febrile condition marked by severe decrease in blood granulocytes an often associated with the use of certain drugs), and *thrombocytopenia* (persistent decrease in the number of blood platelets that is usually associated with a hemorrhagic conditions).

In addition to the above effects, chronic exposures may cause *anorexia* (a prolonged loss of appetite), loss of weight, *anemia* (a condition in which the blood is deficient in red blood cells, in hemoglobin, or in total volume), nervous tension and myoclonic jerks. Chronic administration to animals has produced *necrosis* of the cardiac and skeletal muscles, degeneration of the kidneys and effects of the immune system. Oral administration to mice produced benign and malignant liver *neoplasms*

(a new growth of tissue serving no physiological function) and *lymphomas* (a tumor of lymphoid tissue) and *lung neoplasms*. Oral administration to rats produced liver neoplasms; in rats previously exposed to *n*-nitrosodiethylamine (a material detected in trace amounts in tobacco smoke) DDT increased the incidence of liver tumors. This material may cross the placenta and be excreted in breast milk. It may also impair fertility. Stimulants such as epinephrine or ephedrine may induce *ventricular fibrillation* (a muscular twitching involving individual muscle fibers, acting without coordination, of the chamber of the heart which receives blood from a corresponding atrium and from which blood is forced into the arteries).

Signs and Symptoms of Exposure: Effects of poisoning may be delayed for several hours after exposure. Symptoms of *paresthesias* (a sensation of pricking, tingling or creeping of the skin that has no objective cause) of the tongue, lips and face followed by tremor, a sense of apprehension, dizziness, confusion, malaise, headache, fatigue, weakness, *ataxia*, *nystagmus* (a rapid involuntary oscillation of the eyeballs), increased respiration and hyperexcitability may be experienced.

Medical Conditions Generally Aggravated by Exposure: N/A

Listed as a Carcinogen/Potential Carcinogen:

	<u>Yes</u>	<u>No</u>
In the National Toxicology Program (NTP) Report on Carcinogens	<u>X*</u>	—
In the International Agency for Research (IARC) Monographs	<u>X**</u>	—
By the Occupational Safety and Health Administration (OSHA)	—	<u>X</u>

*Classified as an *anticipated human carcinogen* by NTP.

**Classified as Group 2-B, *animal limited evidence* by IARC.

EMERGENCY AND FIRST AID PROCEDURES:

Skin Contact: Remove contaminated shoes and clothing. Rinse affected area with large amounts of water followed by washing the area with soap and water. Contact medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Contact medical assistance if necessary.

Inhalation: If inhaled, remove the victim to fresh air. If breathing is difficult, give oxygen; if victim is not breathing, give artificial respiration. Contact medical assistance if necessary.

Ingestion: If ingested, wash out mouth with water. Contact medical assistance if necessary.

TARGET ORGAN(S) OF ATTACK: The peripheral nervous system, liver, blood and kidneys.

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in Case Material is Released or Spilled: Notify safety personnel of major spills and/or leaks. Evacuate all nonessential personnel. Ventilate closed area before entering. Stop the leak if you can do so without risk. Use water spray to reduce vapors. Small spills can be absorbed with sand or other absorbent material and place in containers for later disposal. Small dry spills can be recovered with a clean shovel and placed in covered containers. For larger spills, dike far ahead of the spill for later disposal.

Note: Reportable Quantity (RQ): 1 Pound (4.536 Grams)

The Superfund Amendments and Reauthorization Act (SARA) section 304 requires that a release equal to or greater than the reportable quantity for this substance be immediately reported to the local Emergency Planning Committee and the State Emergency Response Commission (40 CFR 355.40). If the release of this substance is reportable under Cercla Section 103, The National Response Center must be notified immediately.

Waste Disposal: Disposal must be in accordance with 40 CFR 165 recommended procedures for the disposal and storage of pesticides and pesticide containers. Follow all Federal, state and local regulations.

Handling and Storage: Employees handling this material must wear protective clothing and gloves to prevent skin contact and splash-proof or dust-resistant safety goggles to prevent eye contact with this substance. Any

chemical cartridge respirator with an organic vapor cartridge in combination with a dust and mist filter must be worn to prevent inhalation. The specific respirator selected must be based on contamination levels found in the work place, must be based on the specific operation, must not exceed the working limits of the respirator and must be jointly approved by the National Institute for Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration (MSHA).

Note: Contact lenses pose a special problem; soft lenses may absorb irritants and all lenses concentrate them.
DO NOT wear contact lenses in the lab.

Do not store DDT in iron containers. High storage temperatures should be avoided. Provide local exhaust ventilation. Ventilation equipment must be explosion proof. Store material in accordance with 40 CFR 165 recommended procedures for the disposal and storage of pesticides and pesticide containers. Vials as received, should be kept tightly sealed, protected from light, and stored in a refrigerator or freezer. Emergency eye wash station must be available.

SECTION VIII. SOURCE DATA/ OTHER COMMENTS

Sources: Occupational Health Services, Inc., MSDS *Dichlorodipenyltrichloroethane*, October 3, 1991.
Dangerous Properties of Industrial Materials, 5th ed., 1979.
Hawley's Condensed Chemical Dictionary, 11th ed., 1987.
The Merk Index, 11th ed., 1989.
Websters Ninth New Collegiate Dictionary, 1990.

Note: Physical and chemical data contained in this MSDS are provided for use in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references, however NIST does not certify the data on the MSDS. The certified values for this material are given only on the NIST Certificate of Analysis.

RM Number: 8467 (Renewals)
MSDS Number: 8467
RM Name: 4,4'-DDE
Issued: May, 1992

MATERIAL SAFETY DATA SHEET

National Institute of Standards and Technology
Standard Reference Materials Program
Gaithersburg, Maryland 20899
(301) 975-2019

SECTION I. MATERIAL IDENTIFICATION

Material Name: 4,4'-DDE

Description: This material is a degradation product of DDT found as an impurity in DDT residues. A unit of RM 8467 consists of one vial containing approximately 100 mg of 4,4'-DDE.

Other Designations: *p,p'*-DDE, 1,1'-(dichloroethenyldiene)bis[4-chlorobenzene]);
2,2-bis-(4-chlorophenyl)-1,1-dichloroethene; ethylene, 1,1-dichloro-2,2-bis(*p*-chlorophenyl);
1,1'-(dichloroethenyldiene)bis(4-chloro-benzene); dichlorodiphenyldichloroethylene

Chemical Formula: Cl-C₆-H₄-C-(C-Cl₂)-C₆-H₄-Cl

CAS Reg. No.: 72-55-9

DOT Classification: Class 6.1 Poison

Manufacturer/Supplier: Available from a number of suppliers.

SECTION II. HAZARDOUS INGREDIENTS

<u>Hazardous Components</u>	<u>Nominal Concentration</u>	<u>Limits and Toxicity Data</u>
4,4'-DDE	~ 100%	*No TLV established.

Rat, Oral:

LD₅₀: 880 mg/kg

Mouse, Oral:

LD₅₀: 700 mg/kg

*The suggested ACGIH-TWA for particulates not otherwise regulated is 10 mg/m³ for total dust.

SECTION III. PHYSICAL/ CHEMICAL CHARACTERISTICS

4,4'-DDE

Appearance and Odor: A white crystalline solid.

Molecular Weight: 318.03

Melting Point (Range): 88 - 90 °C

Solubility in Water: 0.12 ppm

Solubility in Other Compounds: Soluble in ethanol, acetone, dichloromethane, fat and most organic solvents.

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/A

(Method Used): N/A

Autoignition Temperature: N/A

Flammability Limits in Air (Volume %): **UPPER:** N/A
LOWER: N/A

Extinguishing Media: Use dry chemical, water spray or regular foam.

Special Fire Procedures: Fire-fighters should wear self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode and other protective clothing when fighting fires involving this material.

Unusual Fire and Explosion Hazards: This material is a negligible fire hazard when exposed to heat or flame. This

material may burn but does not ignite readily. Containers may explode in the heat of a fire.

This pesticide material with strong oxidizers can present a fire and explosion hazard.

SECTION V. REACTIVITY DATA

Stability: X **Stable** **Unstable**

Conditions to Avoid: Avoid incompatible materials.

Incompatibility (Materials to Avoid): Keep this material from strong oxidizing materials.

See Section IV: Fire and Explosion Hazard Data.

Hazardous Decomposition or Byproducts: Thermal decomposition may include toxic and corrosive fumes of chlorides and toxic oxides of carbon.

Hazardous Polymerization: **Will Occur** X **Will Not Occur**

SECTION VI. HEALTH HAZARD DATA

Route of Entry: X **Inhalation** X **Skin** X **Ingestion**

Health Hazards (Acute and Chronic): Effects for **organochlorine pesticides** (i.e. DDT) may occur for exposures of 4,4'-DDE. Ingestion can occur through oral administration or may occur if sufficient amounts are absorbed from the lungs. A study of occupational exposure to DDT reported a higher frequency of white blood cells with chromosomal abnormalities among workers with high DDT blood levels. Menstrual irregularities are the most frequent complaint among migrant farm workers were observed in another study. Signs of liver and kidney damage can develop. Liver *necrosis* (localized death of living tissue) has been reported in experimental animals. Death may be due to respiratory failure or ventricular fibrillation. Symptoms of poisoning may not occur until several hours after ingestion.

This material may cross the placenta and be excreted in breast milk. It may also impair fertility. Stimulants such as epinephrine or ephedrine may induce *ventricular fibrillation* (a muscular twitching involving individual muscle fibers, acting without coordination, of the chamber of the heart which receives blood from a corresponding atrium and from which blood is forced into the arteries).

Signs and Symptoms of Exposure: Ingestion of organochlorine pesticides may cause gastrointestinal effects of nausea, vomiting, diarrhea, and stomach pains. Confusion, apprehension, irritability, excitability, dizziness, headache, disorientation,

weakness, paresthesias, muscle twitching, tremor, stupor, coma and convulsions may also be experienced.

Medical Conditions Generally Aggravated by Exposure: N/A

Listed as a Carcinogen/Potential Carcinogen:

	<u>Yes</u>	<u>No</u>
In the National Toxicology Program (NTP) Report on Carcinogens	_____	<u>X</u>
In the International Agency for Research (IARC) Monographs	_____	<u>X</u>
By the Occupational Safety and Health Administration (OSHA)	_____	<u>X</u>

Note: A high incidence of liver-cell tumors was observed in mice administered DDE orally (IARC).

The carcinogenicity of this material is still undetermined.

EMERGENCY AND FIRST AID PROCEDURES:

Skin Contact: Remove contaminated shoes and clothing. Rinse affected area with large amounts of water followed by washing the area with soap and water. Contact medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Contact medical assistance if necessary.

Inhalation: If inhaled, remove the victim to fresh air. If breathing is difficult, give oxygen; if victim is not breathing, give artificial respiration. Contact medical assistance if necessary.

Ingestion: If ingested, wash out mouth with water. If the person is conscious and not convulsing, induce vomiting by administering syrup of ipecac (when vomiting occurs, keep the head above below the hips to prevent aspiration). Medical personal can administer activated charcoal followed by gastric lavage. Follow with a saline cathartic. **DO NOT** give fats or oils. Intestinal lavage with 20% mannitol (200 mL) by stomach tube is also useful. Give artificial respiration with oxygen if respiration is depressed. Treat symptomatically and supportively.

TARGET ORGAN(S) OF ATTACK: The blood, liver and kidneys.

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in Case Material is Released or Spilled: Notify safety personnel of major spills and/or leaks. Evacuate all nonessential personnel. Ventilate closed area before entering. Stop the leak if you can do so without risk. Use water spray to reduce vapors. Small spills can be absorbed with sand or other absorbent material and place in containers for later disposal. Small dry spills can be recovered with a clean shovel and placed in covered containers. For larger spills, dike far ahead of the spill for later disposal.

Note: Reportable Quantity (RQ): 1 Pound (4.536 Grams)

The Superfund Amendments and Reauthorization Act (SARA) section 304 requires that a release equal to or greater than the reportable quantity for this substance be immediately reported to the local Emergency Planning Committee and the State Emergency Response Commission (40 CFR 355.40). If the release of this substance is reportable under Cercla Section 103, The National Response Center must be notified immediately.

Waste Disposal: Disposal must be in accordance with 40 CFR 165 recommended procedures for the disposal and storage of pesticides and pesticide containers. Follow all Federal, state and local regulations.

Handling and Storage: Employees handling this material must wear protective clothing and gloves to prevent skin contact and splash-proof or dust-resistant safety goggles to prevent eye contact with this substance. Any chemical cartridge respirator with an organic vapor cartridge in combination with a dust and mist filter must be worn to prevent inhalation. The specific respirator selected must be based on contamination levels found in the work place, must be based on the specific operation, must not exceed the working limits of the respirator and must be jointly approved by the National Institute for Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration (MSHA).

Note: Contact lenses pose a special problem; soft lenses may absorb irritants and all lenses concentrate them.
DO NOT wear contact lenses in the lab.

Provide local exhaust ventilation. Ventilation equipment must be explosion proof. Store material in accordance with 40 CFR 165 recommended procedures for the disposal and storage of pesticides and pesticide containers. Vials, as received, should be kept tightly sealed, protected from light, and stored in a refrigerator or freezer. Emergency eye wash station must be available.

SECTION VIII. SOURCE DATA/ OTHER COMMENTS

Sources: Occupational Health Services, MSDS *2,2-Bis-(4-Chlorophenyl)-1,1-Dichloroethene*, February 21, 1991.
Hawley's Condensed Chemical Dictionary, 11th ed., 1987.
Webster's Ninth New Colligate Dictionary, 1990.

Carmelita S. Davis (301) 975-6439
National Institute of Standards and Technology
Standard Reference Materials Program
Gaithersburg, Maryland 20899

Note: Physical and chemical data contained in this MSDS are provided for use in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references, however NIST does not certify the data on the MSDS. The certified values for this material are given only on the NIST Certificate of Analysis.

Safety data for rhothane



[Glossary](#) of terms on this data sheet.

The information on this web page is provided to help you to work safely, but it is intended to be an overview of hazards, not a replacement for a full Material Safety Data Sheet (MSDS). MSDS forms can be downloaded from the web sites of many chemical suppliers.

General

Synonyms: 1,1-dichloro-2,2-bis(p-chlorophenyl)ethane, dichlorophenyl dichloroethane, 1,1-dichloro-2,2-di(4-chlorophenyl)ethane, tetrachlorodiphenylethane, TDE, DDD, p,p'-TDE, dilene, rothane

Use: organochlorine pesticide

Molecular formula: $C_{14}H_{10}Cl_4$

CAS No: 72-54-8

EINECS No:

Physical data

Appearance: colourless to off-white crystals

Melting point: 109 C

Boiling point: 193 C

Vapour density:

Vapour pressure:

Density ($g\ cm^{-3}$):

Flash point:

Explosion limits:

Autoignition temperature:

Water solubility:

Stability

Stable. Incompatible with strong oxidizing agents.

Toxicology

Harmful if swallowed, or absorbed through the skin.

Toxicity data

(The meaning of any toxicological abbreviations which appear in this section is given [here.](#))

ORL-RAT LD50 113 mg kg⁻¹

ORL-MUS LDLO 600 mg kg⁻¹

SKN-RBT LD50 1200 mg kg⁻¹

Risk phrases

(The meaning of any risk phrases which appear in this section is given [here.](#))

R21 R22.

Transport information

(The meaning of any UN hazard codes which appear in this section is given [here.](#))

UN No 2761. Hazard class 6.1. Packing group III.

Personal protection

Safety glasses.

Safety phrases

(The meaning of any safety phrases which appear in this section is given [here.](#))

[Return to [Physical & Theoretical Chemistry Lab. Safety home page.](#)]

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International Chemical Safety Cards

HEPTACHLOR

ICSC: 0743

<p style="text-align: center;">HEPTACHLOR 1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene $C_{10}H_5Cl_7$ Molecular mass: 373.35</p> <p>CAS # 76-44-8 RTECS # PC0700000 ICSC # 0743 UN # 2761 EC # 602-046-00-2</p>			
TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Liquid formulations containing organic solvents may be flammable. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION	Explosion hazard will depend on the solvent used or on the characteristics of the dust.		In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		PREVENT DISPERSION OF DUST! PREVENT GENERATION OF MISTS! STRICT HYGIENE!	
• INHALATION	Irritation from dust.	Breathing protection.	Fresh air, rest. Refer for medical attention.
• SKIN	MAY BE ABSORBED!	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
• EYES		Safety goggles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work.	Do NOT induce vomiting. Rest. Refer for medical attention.
SPILLAGE DISPOSAL		STORAGE	PACKAGING & LABELLING
Do NOT wash away into sewer. Sweep spilled substance into sealable containers. Carefully collect remainder, then remove to safe place (extra personal protection: complete protective clothing including self-contained breathing apparatus).		Separated from food and feedstuffs, strong bases. Cool. Dry.	Do not transport with food and feedstuffs. T symbol R: 24/25-33-40 S: 36/37-44 UN Hazard Class: 6.1 UN Packing Group: II Severe marine pollutant.
SEE IMPORTANT INFORMATION ON BACK			
ICSC: 0743		Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993	

International Chemical Safety Cards

HEPTACHLOR

ICSC: 0743

I M P O R T A N T D A T A	PHYSICAL STATE; APPEARANCE: WHITE CRYSTALS WITH MILD ODOUR OF CAMPHOR.		ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation of dusts from powder concentrates, through the skin especially from liquid formulations, and by ingestion.		
	PHYSICAL DANGERS:		INHALATION RISK: Evaporation at 20°C is negligible; a nuisance-causing concentration of airborne particles can, however, be reached quickly when dispersed.		
	CHEMICAL DANGERS: The substance decomposes on heating producing toxic fumes: chlorine, hydrogen chloride. Reacts with strong oxidants.		EFFECTS OF SHORT-TERM EXPOSURE: Inhalation of dust may cause irritation.		
	OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV: ppm; 0.5 mg/m ³ (as TWA) (skin) (ACGIH 1991-1992). TLV (as STEL): ppm; 2 mg/m ³ (ACGIH 1991-1992). PDK: 0.01 mg/m ³ (USSR 1977).		EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: This substance is possibly carcinogenic to humans. Heptachlor epoxide has been found in human milk in areas with high heptachlor exposure in the population.		
	PHYSICAL PROPERTIES				
		Boiling point at 0.2 kPa: 135-145°C Melting point: 95-96°C Relative density (water = 1): 1.65-1.67		Solubility in water: none Vapour pressure, Pa at 25°C: 0.053 Octanol/water partition coefficient as log Pow: 3.87-5.44 (estimated)	
ENVIRONMENTAL DATA		Heptachlor is persistent and rather immobile in soil. This substance may be hazardous to the environment; special attention should be given to marine crustacea and young fish which are very sensitive. In the food chain important to humans, bioaccumulation takes place, specifically in fish and birds. It is strongly advised not to let the chemical enter into the environment.			
NOTES					
The technical grade is a waxy solid containing ca. 72% heptachlor and 28% related compounds. All uses of this compound are increasingly restricted. Safe and equally effective alternatives should be preferred. Other melting points: 46-74°C for the technical product. Carrier solvents used in commercial formulations may change physical and toxicological properties. Do NOT take working clothes home. Aahepta, Agroceres, Basaklor, Heptagran, Heptamul, Rhodiachlor, Velsicol 104, Drinox, among others are trade names.					
Transport Emergency Card: TEC (R)-61G53b					
ADDITIONAL INFORMATION					
ICSC: 0743		HEPTACHLOR			
© IPCS, CEC, 1993					
IMPORTANT LEGAL NOTICE:		Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.			

CHEM SERVICE INC -- PS-700 HEPTACHLOR EPOXIDE 99.5% PURE -- 6810-00F018389

===== Product Identification =====

Product ID:PS-700 HEPTACHLOR EPOXIDE 99.5% PURE

MSDS Date:07/10/1990

FSC:6810

NIIN:00F018389

MSDS Number: BKXVK

=== Responsible Party ===

Company Name:CHEM SERVICE INC

Box:3108

City:WEST CHESTER

State:PA

ZIP:19381

Info Phone Num:(215) 692-3026

Emergency Phone Num:(215) 386-2100

CAGE:84898

=== Contractor Identification ===

Company Name:CHEM SERVICE INC

Box:3108

City:WEST CHESTER

State:PA

ZIP:19381

Country:US

Phone:215-692-3026

CAGE:84898

Company Name:CHEM SERVICE, INC

Address:660 TOWER LN

Box:599

City:WEST CHESTER

State:PA

ZIP:19301-9650

Country:US

Phone:610-692-3026

CAGE:8Y898

===== Composition/Information on Ingredients =====

Ingred Name:HEPTACHLOR EPOXIDE (SARA III)

CAS:1024-57-3

RTECS #:PB9450000

Fraction by Wt: 99.5%

EPA Rpt Qty:1 LB

DOT Rpt Qty:1 LB

===== Hazards Identification =====

LD50 LC50 Mixture:ORAL LD50 (RAT): 62 MG/KG

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:SKIN: FATAL IF ABSORBED. INHALATION: FATAL. INGESTION: FATAL & TOXIC.

Explanation of Carcinogenicity:NONE

Effects of Overexposure:SKIN: FATAL IF ABSORBED. INHALATION: FATAL.

INGESTION: FATAL & TOXIC.

===== First Aid Measures =====

First Aid:EYES/SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NO BURNS HAVE OCCURED-USE SOAP & WATER TO CLEANSE SKIN. INHALATION: REMOVE TO FRESH AIR. ADMINISTER OXYGEN IF BREATHING DIFFICULTY. ADMINISTER CPR IF CARDIA C ARREST OCCURS. INGESTION: INDUCE VOMITING. DON'T ADMINISTER LIQUIDS/INDUCE VOMITING TO AN UNCONSCIOUS/CONVULSING PERSON. MAKE SURE AIRWAY DOESN'T BECOME OBSTRUCTED BY VOMIT. OBTAIN MEDICAL ATTENTION.

===== Fire Fighting Measures =====

Extinguishing Media:CO2, DRY CHEMICAL POWDER OR SPRAY.

===== Accidental Release Measures =====

Spill Release Procedures:EVACUATE AREA. WEAR APPROPRIATE EQUIPMENT. VENTILATE AREA. SWEEP UP & PLACE IN AN APPROPRIATE CONTAINER. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.

===== Handling and Storage =====

Handling and Storage Precautions:KEEP CLOSED IN A COOL DRY PLACE. STORE ONLY W/COMPATIBLE CHEMICALS. FOR LABORATORY USE ONLY. DON'T WEAR CONTACT LENSES.

Other Precautions:DON'T USE AS DRUGS, COSMETICS, AGRICULTURAL OR PESTICIDAL PRODUCTS, FOOD ADDITIVES OR AS HOUSEHOLD CHEMICALS. AVOID DIRECT PHYSICAL CONTACT. AVOID CONTACT W/SKIN, EYES & CLOTHING. COMPOUND IS VOLATILE .

===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.

Ventilation:HANDLE ONLY IN A HOOD

Protective Gloves:AS REQUIRED

Eye Protection:EYE SHIELDS

Work Hygienic Practices:REMOVE/WASH CONTAMINATED CLOTHING BEFORE REUSE. ONLY TRAINED PERSONNEL SHOULD HANDLE THIS CHEMICAL OR ITS CONTAINER.

Supplemental Safety and Health

===== Physical/Chemical Properties =====

Melt/Freeze Pt:M.P/F.P Text:327.2F

Appearance and Odor:CRYSTALLINE SOLID.

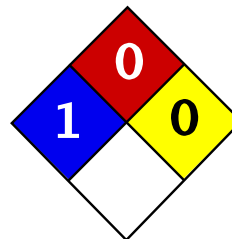
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
LOW REACTIVITY

===== Disposal Considerations =====

Waste Disposal Methods:BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER. DISPOSE OF IN ACCORDANCE W/FEDERAL, STATE, & LOCAL REGULATIONS.

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Health	1
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet

Lead MSDS

Section 1: Chemical Product and Company Identification

Product Name: Lead

Catalog Codes: SLL1291, SLL1669, SLL1081, SLL1459, SLL1834

CAS#: 7439-92-1

RTECS: OF7525000

TSCA: TSCA 8(b) inventory: Lead

CI#: Not available.

Synonym: Lead Metal, granular; Lead Metal, foil; Lead Metal, sheet; Lead Metal, shot

Chemical Name: Lead

Chemical Formula: Pb

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Lead	7439-92-1	100

Toxicological Data on Ingredients: Lead LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:

Slightly hazardous in case of skin contact (permeator).

CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC.

MUTAGENIC EFFECTS: Not available.

TERATOGENIC EFFECTS: Not available.

DEVELOPMENTAL TOXICITY: Not available.

The substance may be toxic to blood, kidneys, central nervous system (CNS).

Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Non-flammable in presence of open flames and sparks, of shocks, of heat.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available.

Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:

SMALL FIRE: Use DRY chemical powder.

LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: When heated to decomposition it emits highly toxic fumes of lead.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not

present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

TWA: 0.05 (mg/m³) from ACGIH (TLV) [United States]

TWA: 0.05 (mg/m³) from OSHA (PEL) [United States]

TWA: 0.03 (mg/m³) from NIOSH [United States]

TWA: 0.05 (mg/m³) [Canada] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 207.21 g/mole

Color: Bluish-white. Silvery. Gray

pH (1% soln/water): Not applicable.

Boiling Point: 1740°C (3164°F)

Melting Point: 327.43°C (621.4°F)

Critical Temperature: Not available.

Specific Gravity: 11.3 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, excess heat

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:

Can react vigorously with oxidizing materials.

Incompatible with sodium carbide, chlorine trifluoride, trioxane + hydrogen peroxide, ammonium nitrate, sodium azide, disodium acetylide, sodium acetylide, hot concentrated nitric acid, hot concentrated hydrochloric acid, hot concentrated sulfuric acid, zirconium.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation. Ingestion.

Toxicity to Animals:

LD50: Not available.

LC50: Not available.

Chronic Effects on Humans:

CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC.

May cause damage to the following organs: blood, kidneys, central nervous system (CNS).

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:

Acute Potential:

Skin:

Lead metal granules or dust: May cause skin irritation by mechanical action.

Lead metal foil, shot or sheets: Not likely to cause skin irritation

Eyes:

Lead metal granules or dust: Can irritate eyes by mechanical action.

Lead metal foil, shot or sheets: No hazard. Will not cause eye irritation.

Inhalation:

In an industrial setting, exposure to lead mainly occurs from inhalation of dust or fumes.

Lead dust or fumes: Can irritate the upper respiratory tract (nose, throat) as well as the bronchi and lungs by mechanical action. Lead dust can be absorbed through the respiratory system. However, inhaled lead does not accumulate in the lungs. All of an inhaled dose is eventually absorbed or transferred to the gastrointestinal tract. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include metallic taste, chest pain, decreased physical fitness, fatigue, sleep disturbance, headache, irritability, reduces memory, mood and personality changes, aching bones and muscles, constipation, abdominal pains, decreasing appetite. Inhalation of large amounts may lead to ataxia, delirium, convulsions/seizures, coma, and death.

Lead metal foil, shot, or sheets: Not an inhalation hazard unless metal is heated. If metal is heated, fumes will be released. Inhalation of these fumes may cause "fume metal fever", which is characterized by flu-like symptoms. Symptoms may include metallic taste, fever, nausea, vomiting, chills, cough, weakness, chest pain, generalized muscle pain/aches, and increased white blood cell count.

Ingestion:

Lead metal granules or dust: The symptoms of lead poisoning include abdominal pain or cramps (lead colic), spasms, nausea, vomiting, headache, muscle weakness, hallucinations, distorted perceptions, "lead line" on the gums, metallic taste, loss of appetite, insomnia, dizziness and other symptoms similar to that of inhalation. Acute poisoning may result in high lead levels in the blood and urine, shock, coma and death in extreme cases.

Lead metal foil, shot or sheets: Not an ingestion hazard for usual industrial handling.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Lead

California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (female) which would require a warning under the statute: Lead

California prop. 65: This product contains the following ingredients for which the State of California has found to

cause reproductive harm (male) which would require a warning under the statute: Lead
California prop. 65 (no significant risk level): Lead: 0.0005 mg/day (value)
California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Lead
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Lead
Connecticut hazardous material survey.: Lead
Illinois toxic substances disclosure to employee act: Lead
Illinois chemical safety act: Lead
New York release reporting list: Lead
Rhode Island RTK hazardous substances: Lead
Pennsylvania RTK: Lead

Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):

R20/22- Harmful by inhalation and if swallowed.
R33- Danger of cumulative effects.
R61- May cause harm to the unborn child.
R62- Possible risk of impaired fertility.
S36/37- Wear suitable protective clothing and gloves.
S44- If you feel unwell, seek medical advice (show the label when possible).
S53- Avoid exposure - obtain special instructions before use.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:

Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:21 PM

Last Updated: 11/06/2008 12:00 PM

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APPENDIX C

HURRICANE PREPARATION PLAN

HURRICANE PREPARATION PLAN

OU1 SITE 83 SOIL DELINEATION SAMPLING MCAS, CHERRY POINT, NORTH CAROLINA

CONTRACT NO. N40085-08-D-1409

CTO: 0002

JULY 2009

Rhēa Project No: 389

Prepared for:

NAVFAC Mid-Atlantic
NC IPT, Code OPCEV
C/O LRA Building C
6526 Hampton Boulevard
Norfolk, VA 23508

Prepared by:

Rhēa Engineers & Consultants, Inc.
4975 William Flynn Highway, Suite 14
Gibsonia, Pennsylvania 15044

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OU1 SITE 83 SOIL DELINEATION SAMPLING

MCAS CHERRY POINT, NORTH CAROLINA

HURRICANE PREPARATION PLAN

1.0 PURPOSE AND SCOPE

Rhēa Engineers and Consultants, Inc. (Rhēa) has prepared this Hurricane Preparation Plan (HPP) to establish the standard operating procedures to follow in the event that impending hurricane weather conditions may affect site activities. Our goal is to provide for the safety of personnel and minimize financial loss caused by severe weather conditions.

Hurricanes are most likely to occur along the North Carolina coastline between June 1 and November 30 of each year. Since meteorologists are unable to accurately forecast hurricane storm speed, direction, or intensity, it is important to develop a plan of action to prepare for such events. The emergency procedures described herein apply to all Rhēa team personnel, subcontractors, and visitors associated with this project.

2.0 DEFINITIONS

2.1 TROPICAL DISTURBANCES

Powerful cyclones characterized by destructive sustained winds, water spouts, heavy rain, and flooding are caused by depressions over tropical waters. Tropical disturbances are typically categorized by maximum surface wind velocity. The following describes the various degrees of tropical disturbances:

- Tropical Depression - Maximum surface winds of 38 miles per hour (mph);
- Tropical Storm - Maximum surface winds of 39 to 73 mph; and
- Hurricane - Maximum surface winds 74 mph or greater.

2.2 CONDITIONS OF READINESS

Commander, Naval Base Norfolk, has established five Conditions of Readiness (CORs) for hurricanes and other potentially dangerous tropical storms. The following describes each COR:

- **Condition V** - Destructive winds are possible at the Marine Corp Air Station (MCAS) Cherry Point within 96 hours;
- **Condition IV** - Destructive winds are possible at the MCAS Cherry Point within 72 hours;
- **Condition III** - Destructive winds are possible at the MCAS Cherry Point within 48 hours;
- **Condition II** - Destructive winds are possible at the MCAS Cherry Point within 24 hours; and
- **Condition I** - Destructive winds are possible at the MCAS Cherry Point within 12 hours.

2.3 HURRICANE NOTIFICATION

The National Weather Service will issue either a “watch” or a “warning” depending on the potential time of impact of the storm. These terms are described below:

- **Hurricane Watch** - A hurricane watch means that there is a threat of hurricane or tropical storm conditions in the coastal North Carolina area in the next 36 hours.
- **Hurricane Warning** - A hurricane warning is issued when a hurricane or tropical storm is expected to affect coastal North Carolina within 24 hours.

The National Weather Service classifications are described here only for reference. Official notification of upgrade or downgrade of condition of readiness will be provided by the Resident Officer In Charge of Construction (ROICC). The Rhēa team will be prepared to commence site security response action for condition upgrade within two hours of notification from the ROICC, regardless of time of day. For a listing of emergency telephone numbers please see the Site Health and Safety Plan (HASP).

3.0 RESPONSIBILITIES

Worker safety during a hurricane requires the dedicated team effort from all Navy and Rhēa personnel. The proper organization and coordination of personnel will result in a smooth transition from execution of routine activities to completion of securing operations. Rhēa's Project Manager (PM), Site Health and Safety Officer (SHSO), and site labor forces each have specific responsibilities critical to the execution of this plan.

The ROICC will have the authority to direct the implementation of this plan. The ROICC will also be responsible for authorizing work to commence after the storm event.

3.1 PROJECT MANAGER

The PM is responsible for overall management of site activities. The PM's role in hurricane preparation is to verify that the field crews are adequately trained in the procedures outlined in this plan. The PM will verify that the field staff has adequate funding for resources (i.e., personnel, materials, and equipment) required to perform the response preparation actions. The PM will be supplied with or have record of inventory deemed irreplaceable and will make arrangements for its proper protection.

3.2 SITE HEALTH AND SAFETY OFFICER

As described in the HASP for this Project, the SHSO is the Site Superintendent (SS), and he will serve as the emergency coordinator (EC). In this role, the EC will be responsible for assuring the proper execution of this HPP in the field. The EC will be responsible for the coordination of personnel, supplies, and equipment necessary to begin securing operations within two hours of notification of condition upgrade from the ROICC. The EC will be the primary liaison between the ROICC, PM, and the site labor forces.

The EC will continue to monitor safety activities during execution of this plan and will retain authority to stop work due to impending weather conditions if, in his opinion, worker safety may be jeopardized.

3.3 SITE LABOR FORCES

Site laborers will be responsible for the actual performance of the site preparation at the direction of the EC. Laborers should also offer suggestions and alert the EC of any changing conditions.

4.0 RESPONSE ACTIONS

The following sections describe the requirements expected during each of the five conditions of readiness. The action items described in this plan should be used for guidance only since it is impossible to develop contingency plans for each activity associated with a field project. The handling of specific field situations that are not described in the following action lists will be at the discretion of the EC.

4.1 CONDITION V (DESTRUCTIVE WINDS WITHIN 96 HOURS)

The following activities will be performed at a minimum when Condition V response is required by the ROICC:

- Continue routine work activities;
- Perform normal daily job site cleanup and maintain good housekeeping practices, including containerizing waste materials and maintaining clear walkways to prevent tripping hazards;
- Notify site labor about impending dangers and train site workers on the content of this plan. Refresh work crews on general emergency response procedures (i.e., evacuation routes) as outlined in the HASP;
- Take inventory of emergency supplies such as first aid kits, sorbent material, polyethylene sheeting, security fencing, sand bags, and drums. Replenish supplies as necessary;
- Inspect the integrity of existing erosion and sedimentation controls (i.e., silt fence, hay bales, and erosion matting) and existing drainage receptor facilities. Make arrangements to repair deficient items;
- Inspect the office and/or storage trailer tiedowns for wear, pullout, or other damage. Make arrangements to repair deficient workmanship;

- Arrange to either transport contaminated materials off site or temporarily stage materials in competent containers (i.e., drums, roll-off boxes);
- Review requirements for Condition IV; and
- Contact ROICC for COR updates and completion of required actions.

4.2 CONDITION IV (DESTRUCTIVE WINDS WITHIN 72 HOURS)

The following activities will be performed at a minimum when Condition IV response is required by the ROICC:

- Continue Condition V preparations, if necessary;
- Continue routine work activities that do not affect preparation requirements described in this plan;
- Perform normal job site cleanup and maintain good housekeeping practices;
- Place lumber, piping, and other job materials in neat piles (less than four feet high) in a designated laydown area;
- Remove and store debris that may become “missile” hazards (i.e., any object that may become airborne in high winds);
- Review requirements for Condition III; and
- Contact ROICC for COR updates and completion of required actions.

4.3 CONDITION III (DESTRUCTIVE WINDS WITHIN 48 HOURS)

The following activities will be performed at a minimum when Condition III response is required by the ROICC:

- Maintain Condition IV requirements;
- Cease work activities that cannot be completed within 18 hours. Schedule work to minimize open excavations and other low-lying depressions that may collect water;
- Cease other work activities that interfere with securing operations;

- Begin stowing and securing portable equipment. Gasoline-powered portable equipment should be placed in a storage trailer when possible to prevent overturning;
- Secure portable sanitation facilities;
- Consolidate drums in drum storage area. Where possible, affix content label to the inside lid of the drum before tightening lid brackets. Arrange drums against permanent structure if possible. If this arrangement is not practical, arrange heavier drums around the perimeter of the drum staging area;
- Dismantle decontamination area and secure supplies;
- Review requirements for Condition II; and
- Contact ROICC for weather and COR updates and completion of required actions.

4.4 CONDITION II (DESTRUCTIVE WINDS WITHIN 24 HOURS)

The following activities will be performed at a minimum when Condition II response is required by the ROICC. Cease routine work activities until securing operations are completed.

- Cease routine work activities until securing operations are completed. Do not begin new scope of work tasks;
- Consolidate wood and piping piles and secure to ground using soil/concrete anchors and cables. As an alternative, excess building materials may be stored in an empty roll-off box or other suitable enclosed container sufficiently anchored to the ground surface;
- If off-site transportation of waste materials is not practical, cover contaminated waste stockpiles with 10-mil minimum plastic sheeting. Anchor sheeting using sandbags at a rate of one bag per 20 square feet of liner and one bag per five lineal feet of stockpile perimeter. Do not use scrap lumber, piping or

jagged rocks for this purpose. If practical, park heavy equipment in the anticipated upwind position in front of the waste material stockpile;

- Band drums together to form a single unit using steel banding equipment or heavy-duty ropes;
- Refuel heavy equipment. Fuel may be in short supply in the days following a hurricane. Secure temporary fuel storage tank if applicable;
- Pack all monitoring equipment, fax machine, computers, printers for transport to safe storage;
- Record storage inventory of all supplies, materials, drums, equipment remaining at the site; and
- Contact ROICC for weather updates and completion of required actions.

4.5 CONDITION I (DESTRUCTIVE WINDS WITHIN 12 HOURS)

The following activities will be performed at a minimum when Condition I response is required by the ROICC:

- Perform all remaining actions associated with the previous CORs;
- Secure tarps on roll-off containers;
- Arrange heavy equipment in a manner to protect other supplies, equipment, and/or stockpiles;
- Collect site files, plans, records, and drawings and transport to safe storage location;
- Personnel lodging in a hotel shall be provided with non-perishable food and drinking water for three days; also provide flashlight, batteries, transistor radio, personal hygiene supplies, and first aid supplies including bandages, pain relievers and special medications;

- Unplug all electrical components and switch external power supply to the OFF position;
- Document secured site with photographs;
- Notify ROICC of date and time of departure and anticipated date of return; and
- Lock all doors, account for all personnel, and leave site.

5.0 RESUMPTION OF WORK

The ROICC will retain the authority to commence work activities. Before work begins, the ROICC and EC shall visit the site and assess damages. Inventory of supplies, materials, drums, and equipment will be verified at this time. Scope of work activities will commence as soon as practical after notice to proceed is directed by the ROICC.

A written damage assessment will be prepared by the EC, reviewed and approved by the ROICC, and forwarded to the PM.